RAILROAD GAZETTE

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The office of the Railroad Gazette is now at 32 PARK PLACE, New York.

Contributions.

Rule 20.

TRENTON, N. J., May 29, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The recent editorial in the *Railroad Gazette* (May 25) assumed a position on the above rule which does not seem to me to be in accordance with the terms of the rule. This was to the effect that an outgoing train under the new time table, having found on the register that No. 36 of the old had arrived, was not bound to look for No. 36 of the new, of which the arriving time was not long after the hour for the new time table to take effect.

I think that a full examination of the language of the rule will show that it will not sustain this position. It says that "Each time table, from the moment it takes effect, supersedes the preceding time table, and all special instructions relating thereto." This being the case, the moment the new time table takes effect all trains of the old are in fact annulled, and cannot move as regular trains, unless so situated as to be able to assume corresponding numbers of the new time table, and each train on the new is bound to look for every opposing train thereon. Thus, if No. 36 of the old is timed to arrive at 11.55 p. m., and does so arrive, and on a time table taking effect at midnight No. 36 is to arrive at 12.05 a. m., this train must be looked for. No opposing train has a right to inquire how such a train is to get into the position by which it can so arrive. It is due and must be looked for. If old 36 falls back and takes the new time its former character and rights are cancelled by the new time table taking effect and it runs under that. After 12 o'clock the old schedule is dead and nothing has any rights under it, and old 36 is not to be looked for. In the case considered there was a meeting point on the new time table for 35 and 36, and it appears from the statement of facts that 35 ignored this because old 36 had arrived. This, it appears to me was without authority. It was only an inference which appeared afterward to be correct, that new 36 was not on the road, but it was an inference which 35 had no right to act on.

The language of the rule is perfectly plain, and if it is taken exactly as it reads there can be no misunderstanding. The difficulties which I have seen mentioned have come chiefly, or altogether, from a desire to do with a general rule something that a general rule cannot do. Cases that it does not provide for should, as the committee have said, be provided for by special orders. If the cases of trains that will be out of reach cannot be anticipated by such orders, an order on the time table directing such trains to run extra would enable them to move until they came within reach.

The rule has been criticized on the general ground that a rule must be defective that gives rise to so much misunderstanding; but in fact, it is not the fault of the rule or of its language, but of those who are unwilling to apply strictly its very clear provisions. If taken in the common sense way, as should be done with any rule, the misunderstanding disappears.

J. A. ANDERSON.

[In printing the communication two weeks ago we deprecated discussion on Rule 20; and now the words prove a hollow mockery. As Mr. Anderson sat with the committee that made the rules no one can deny that he knows what he is talking about. But the man who made the rule is not the only one to vex us; the man who uses it—and who wrote the former communication—is also up in arms (see his letter below). In view of this combined onslaught we may as well come down at once.—EDITOR RAILROAD GAZETTE.]

SAVANNAH, Ga., May 27, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I note your editorial remarks in your issue of May 25 with reference to my inquiry based on Standard Rule No. 20, but I regret my inability to understand the question as you do. In the case we had, Train 36 of May 13, was the first due on time table No. 3. Under a strict literal construction of Rule 20, I maintain that Train 35 was not required to examine the register with reference to any opposing trains due before 12.01 a. m., May 13—*i. e.*, due on the superseded time table No. 2. Our rule reads: "Each time table, *from the moment it takes effect, supercedes* the preceding time table . . . And "all regular trains on the road running according to the preceding time table shall, *unless otherwise directed*, assume the times and rights of trains of corresponding numbers on the new time tables." It is, therefore, beyond question, impossible for any train to run after 12.01 a. m., May 13, *unless* it does so by assuming a schedule of its own number, *or* under orders from the despatcher as an extra. In the case in question, if 36 had not reached Cayce by 12.01 a. m., May 13, it would then have had to run as an extra under special instructions, or would have fallen back and assumed the "times and rights" of 36 on time table No. 3, due at Cayce 2 a. m., May 13.

I am ready to concede that 35, under the circumstances, *possibly* had the right to move, without orders, against 36 of May 13, on new time table, inasmuch as 36 had arrived on time on the superseded time table. Is there anything in the rules giving trains rights from *terminals* on new time tables that they do not enjoy on the road. That is to say is there anything to indicate that a train leaving a terminal after a new time table becomes effective has rights not held by a train that is overtaken between terminals at the moment a time table is superseded?

SAVANNAH.

Interior Decoration of Passenger Cars.

[WITH AN INSET.]

Few people realize or appreciate the labor and skill required to produce a modern car for passenger service. Probably not one passenger in twenty can understand, nor one in a hundred analyze the wonderful application of science and the subtle adaptation of art to render a modern car beautiful, safe and comfortable. Not only is the best mechanical skill required in the design and construction of a car, but the most cultivated talent in artistic design is employed to make the exterior as well as the interior attractive and pleasing, and the growth in taste in the last few years is quite wonderful. We have long given a great deal of attention to the mechanical side of car design and construction, and it is our purpose to show in this issue something of their interior decoration. Car builders have not as a class given much close personal attention to the decoration of their cars. Architects, artists and specialists employed by car manufacturers have in the past furnished designs for the artistic effect of interiors. But it is predicted that the time is not far distant when a car builder will be expected to control closely the decoration of his cars as well as to furnish the mechanical details. A master car builder may reasonably be required to select and determine the make-up of an ordinary day coach at least, and to do it artistically. It is very much to the credit of American car designers and builders that their interiors are fully in keeping with the mechanical features, and that both, for their purposes, are unexcelled. Anyone who attended the World's Fair and compared the foreign with the American exhibits, will not question the statement that American cars are unsurpassed. To the master car builder is due all credit to the perfection of the mechanical details and construction of our cars, but the same cannot be said with regard to the interior decorations, even of many first-class day coaches that are run and operated by the roads of the company. The cars exhibited at the World's Fair, the numerous private cars and the elaborate cars of the palace car companies, afford unparalleled examples of interior car decorations. They do not represent the creation of our master car builders, but of artists, architects and specialists employed by the companies manufacturing them. Many of these cars represent certain types or styles of architecture or art, and in these designs which we illustrate in this issue we have grouped and selected cars with reference to those types. These cars illustrate certain pure and distinct styles of car decorations and they are very instructive as such.

A style of decoration occasionally employed with good effect is the Byzantine. This style, with its round arch doors and windows, the lavish geometrical, floral and ecclesiastical figures, permits the decorator to ornament every panel, post, rib, arch and rail of his car. The decorations are in low relief and may be executed in paint or by carving. Figs. 1 and 2 are two good Byzantine interiors; the former is one of the Pullman Co.'s cars exhibited at the World's Fair, and was designed and built at its works. The interior is that of a smoking apartment, 27½ ft. long, furnished with one settee, 11 arm chairs, one lounge and a writing desk. The writing desk may be seen at the end against the bulkhead partition, with library cases on either side. The elaborate carving and decorations have been executed in selected vermillion wood, with carved ornaments in low relief, which are hand polished and finished in varnish. The windows are in groups of three, the large one 46 ins. wide, and two smaller ones 20 ins. each. Between these, two carlines project into the room in imitation of heavy pilasters and corbel like supports of the arched deck carlines.

The deck windows are semi-circular; the center pane being glazed with decorated glass. The upper parts of all the windows, comprising one-fourth of all their area, are of leaded glass, in tints to harmonize with the other parts of the car. The windows are surmounted by a deep and highly decorated cornice resting upon the curved capitals of the pilasters. From these cornices are suspended the window shades of Scotch Holland; the drapery curtains are of silk, trimmed with handsome fringe. The balances under which these curtains hang are suspended from the same cornices. The clear story windows are arranged in groups of three round windows; the sash is made of bronze, divided into four panels. Each sash is filled with osiered glass. These windows are pivoted at the bottom and fixed with quadrants to hold them in place. The ceilings are of three-ply veneer, painted and decorated with low-relief ornaments and gilded to harmonize with the surrounding features.

The upholstery of chairs, settees and lounge is executed in very soft leather, sumptuously tufted, and garnished with gilt nails. The floor is covered with a Wilton carpet of a specially high pile. On the center of the bulkhead directly over the desk is a jardinière of tropical plants, and the opening is draped with a balance from which is suspended the rope portière.

Fig. 2 shows another Byzantine interior designed by Mr. Bruce Price, of New York. It is an interior of a drawing room car built some years ago for the Boston & Albany Railroad by the Wason Manufacturing Co. The design has been characterized as a pure Byzantine. The turtle back roof and absence of deck windows must give it a sombre appearance, which, with the geometrically finished ceiling, carry out the Moorish idea. This is, however, dispelled by the floral figures, statuary, bay windows and other features below. The woodwork is mahogany, richly carved, and with metal work of statuary bronze. The colors are rich but low in tone, the desire being to impress one with a refined and restful elegance entirely free from any glitter other than that of the leaded crystal plate glass over the windows. An element of retirement pervades every part of the car; the basket racks, lamps, metal furnishings and even the bases and capitals of the columns are so adroitly concealed as to be hardly noticed unless looked for. The carlines and purlins all enter into and form a part of the decorations of the car. The ceiling is an imitation of old leather with a ground of tarnished gold; the decorations are flat, and in delicate, free-hand pencil lines. The basket racks are placed in windows or lunettes so that they project only three or four inches into the car. These break up the sides of the car and destroy the tunnel-like appearance that it would otherwise have. They also lend greater width and height to the car's appearance, and afford some light for the otherwise dark ceilings.

Though this car is a fine study from the artistic side, it has been a disappointment. It has proved too dark, and the sombre retirement sought by the artist is said to have been too gloomy and melancholy for the average American traveler; in fact it affords a good illustration for a pretty general rule, that cars must be roomy and well lighted to meet the favorable criticism of the American traveling public.

A general style employed more than the Byzantine is the Renaissance, under which the styles of the French period may be included. This style is admirably shown in Figs. 3 and 4. Both are of dining cars, and one, Fig. 3, by the Wagner Palace Car Co., is in Italian Renaissance, while the other, Fig. 4. is characterized as American Renaissance. The former has beautifully carved and decorated chairs with leather coverings, very much in keeping with its other features. The open railings or partitions are embellished with elegant designs in metal and wood. A special feature is the ceiling, which shows in bold relief the beautifully composed decoration in flowers and nude figures. The draperies are of new design, and of plain, rich silk embroidered in gold and metal; the carpet is Royal Wilton.

The Pullman car, Fig. 4, is more modern in appearance and is called American Renaissance. It is executed in selected vermillion wood and embellished with hand carving. The dining room is divided into five sections by low partitions to which pivoted opera seats are attached. These partitions are fixed and elaborately decorated with festoons and figures carved in the natural wood. They, as well as the seats, are upholstered in brown and green tinted leather, embossed and hand decorated. Between the seats are adjustable tables large enough to comfortaby seat four persons. Each table has a spacious window, four-fifths of whose height is fitted with beveled glass; the remaining fifth is glazed with tinted leaded glass. The windows are draped with tasseled balances from under which the curtains are suspended. The space between the windows is transformed into a massive pier which contains a niche resting upon a shelf handsomely carved in imitation of stone work. This shelf projects six inches into the car and three inches into the side. The niche is backed with three mirror panels and canopied with a finely carved head or top. At the sides of the niche are two capitals. Supported by these capitals and above the niche, the decorations are continued to the roof in imitation of carved beams and brackets. The ceiling is of Empire shape, with relief ornaments in composition and painted in various colors to harmonize with the whole. The bulkhead at the end is arranged with a large opening draped with rope portières. On each side of the entrance projecting niches rest on finely carved shelves. These niches and those on the side piers as well, are intended for ornamental purposes only. In the rear of the bulkhead may be seen a jardinière for

a large basket. There are metal framed doors on each side. This jardinière is made of driven wrought iron of an exquisite design and in harmony with the grills over the transoms of the bulkhead partition. This work and the screens and fixtures are all black wrought iron, and the furniture has the same style of ornamentation. Electric lamps furnish light for the cars and they are supported in neatly driven or repoussé iron work fitted with special globes which receive the current from storage batteries underneath the car. The ventilation is effected through the deck windows, which are arranged in sets of three over each section. The deck sashes are glazed with handsomely tinted glass in leaded frames, and may be operated separately.

A beautiful example of French Renaissance characterized as Louis XVI. applied to car decorations is shown in Fig. 5. This car is one of those exhibited by the Wagner Co. at the World's Fair. It is a buffet parlor car furnished with every modern convenience. The decorations are extremely elaborate, and those of the opera box shown are unexcelled. The open brass work in the railing both above and below is a masterpiece. The relief work in the ceiling consists of flowered and human figures artistically executed. The Turkish and French chairs are covered with cream and green striped silk tapestry with flowers interwoven. The drapery is of silk damask in shades of green that harmonize with the other decorations, coverings and the Scotch Axminster carpets.

The Romanesque is the style of interior decoration which prevailed some five years ago in private and parlor cars, and a flavor of it is often seen in coaches to-day. A good type is shown in Fig. 6, which is a bay window parlor car built for general service by the Pullman Co. The interior wood work is San Jago mahogany, which is wrought into columns, grills and mouldings, of plain, but graceful forms, to a Romanesque design. The basket racks and lamps add greatly to this style and to the general tone of the car. The racks are of bronze and of two sizes, the one in the bay being unusually large. A wood grill is arched from the post of the bay window to the basket rack and so joined as to seem a part of it. The lamps are of a special design, and are very much in keeping with the other features of the car. They are intended to burn mineral sperm oil. The lower part of the bulkhead partition seen has beveled panels, while the upper part is finished with wood grill work arched high and wide. The upper part of the carved front of the buffet seen through the arched passage way has brass frames filled with beveled glass. The ceiling is in three-ply veneer, and the upper deck ceiling is in large panels running from side to side, richly decorated in color and gold. The deck windows have short lights of beveled glass with center panels chipped. The chairs are upholstered in pousson plush, and the draperies harmonize in color and general make-up.

Another Romanesque design is shown in Fig. 7, which is the interior of an observation sleeping car of the Pennsylvania limited express. This observation room is 23 ft. 8 in. long and has on either side two bays of four windows each which are artistically draped and furnished with serviceable shades. The basket racks are placed as in Fig. 6, the wood grills being replaced by decorated facia board with miniature columns at the sides. There are 16 easy chairs of wood and wicker work of all sizes and shapes. Instead of grill work the bulkhead is decorated with latticed windows and the door jambs are formed by columns and surmounted with arches. The ceilings and mouldings do not differ materially from those of the other car. The deck windows are glazed with chipped glass. Mineral sperm oil is burned in the lamps, which are of a special pattern.

A style of decoration that is peculiarly appropriate for interior car decorations is the Colonial. The plain open work and the light coloring that accompany the style are very pleasing to the traveler. Figs. 8, 9, 10 and 11 show four different cars beautifully executed in this style. Fig. 8 is one of the Wagner exhibition cars and it is most elaborately decorated. The festoons and bronze work suggest the Empire style. This car is finished in Circassian walnut, richly carved and wrought; in fact the wood work is the chief characteristic of the style and its strongest features may be seen on the bulkhead partition in the foreground. Such elaborateness in detail as is shown in the brass work, sides and ceilings is rarely met in the Colonial. It has been carried out in the bookcase and even in the bindings of the books which it contains. The windows are 3 ft. 9 in. in width, draped in silk velvet. The chairs are in plain leather.

An objection to the Colonial is the white wood-work, shades and trimmings which soil so easily, but the light coloring is an essential of the style. This lack of coloring is shown in Fig. 9, which has been called Colonial though it differs but slightly from the Empire. The engraving is an interior of a Pullman parlor car. The wood work is in San Domingo mahogany with pilasters and brackets. The basket racks are placed upon a shelf or cornice which is supported by three carved brackets at equal distances from the centre. The cornice and facia decorations of this shelf are carried throughout the length of the car. The basket rack is very ornamental and in polished brass, and very much in keeping with the other decorations. Even in the design of the chairs the artist has kept the light colors and general features of the whole design. They are upholstered in hair cloth and have adjustable backs. The background against the bulkhead and between the chairs is a library with books, magazines and papers. The draperies, lambrequins, hangings and carpet are in light colors, to conform to the general interior. The clear story is well lighted with large arched deck windows with radial ribbed sash.

A good illustration of the Colonial applied to a day coach is shown in the Pullman World's Fair car, Fig. 10, where the same plain, narrow, unbroken lines, and the delicate decorations of the ceiling are seen. Some new features are presented in the ceilings. The curved shape of the lower deck ceiling extending from window cornice to purlins and between purlins is unusual, and gives a very roomy appearance to the car. The wood finish is in mahogany and of a new design, strongly tending to Colonial, but departing somewhat from it in the colorings. The window shades are of olive colored tapestry, mounted upon Hawthorne fixtures. The basket racks are bronze, of the Empire style. Hair cloth has been used to upholster the seats, which are Hale & Kilburn pattern, No. 73. The cars are lighted by electricity and by semi-circular deck windows placed at considerable distance apart.

Fig. 11 gives a fourth example of Colonial car design built and furnished by the Wason Manufacturing Co. It is a dining or café car, built for service in the Adirondack mountains. The paneling, sideboard, tables and chairs are all in keeping. A new feature is the ceiling paneled in light blue and brocaded silk. The furniture is in white oak, finished light. Between the windows are plate glass mirrors in hand-carved quartered oak frames.

The style most employed in recent designs for palace car decoration is the Empire. Both the Pullman and Wagner Palace Car Companies exhibited examples of this style at the World's Fair. Two of the finest are those shown in Figs. 12 and 13. Fig. 12 is the interior of the Wagner sleeping car "Isabella." The decorations are very delicate and are wrought in San Jago mahogany. The reproduction is from a photograph of one of the double state rooms, finished in ivory and gold. The hangings are in silk damask and the draperies of a rose shade; the furniture is blue. The decorations are especially unique and typical of the style. Fig. 13, exhibited by the Pullman Co. possesses the same general features, and the same delicate outlines of decoration are shown, yet they are quite unlike in detail. The view is of the drawing room of a sleeping car. The door seen at the right may be closed to divide the apartment into two separate sleeping rooms. When closed they form a tight partition between the two rooms without visible joints. The whole is painted a cream white with gilded ornaments in relief. The panels of the bunk front are covered with embroidered satin reps. Both rooms are richly upholstered with brocade and the draperies harmonize with the whole. The electric lamps are suspended from the ceiling.

Fig. 14 shows a beautiful example of Empire decoration. It is not so elaborate as some of the Exposition cars of the Pullman Company, for it is for general service, but it is better for that. This car, like the others, has the Empire roof, leaded glass, rope portières, Wilton carpet, with carved and gilt ornaments and numerous deck windows with decorated glass. The seats are of hair and fibre from Italy. Attention is called to decorations of the bunk panels, to the special design of lamps, and to the carline and ceiling decorations.

Two cars of elaborate Empire style are shown in Figs. 15 and 16. They are both heavily bracketed, and have special designs of Empire roofs. Both cars belong to the Pullman exhibit at the World's Fair. Fig. 15 is a parlor car finished in vermillion wood and gilded relief ornaments, pilasters and caps. There are two bay windows on each side which breaks the repetition that is so monotonous in long cars. The strong light from the deck and bulkhead windows is subdued by leaded glass of various tints. The revolving chairs are of a new pattern in vermillion wood, trimmed in gilt headings and rosettes, and upholstered in tufted tapestry. The drapery curtains are light brocaded silk, and are hung upon rods supported in the capitals of the columns. The windows are also provided with a Holland window shade, and over these are the balances from under which hang the drapery curtains. The draperies at the end of the car are in keeping with those at the windows and the door is draped with a rope portière.

An entirely new design in car roofing and decoration is shown in Fig. 16. From the base boards up the side to the center of the roof there are new features of interior decoration. This is a parlor car built by the Pullman Company for its Columbian exhibit. The first glance suggests a saloon of a steamship. It is executed in choice selected vermillion wood and gilded relief ornaments. The sides are broken with two bays of three windows each, which, with the heavy cornice and shelf-like projection over them, relieves the tunnel-like appearance of the car. This, with the elaborate brackets and heavy cornice at the deck plate, gives a gorgeous display of carved decorations. The roof is of new and peculiar shape, the deck windows, with their intersection with the roof and the relief decorations joining the two, giving an impression of a vaulted chamber. The bulkhead at the end is almost classical in style, and suggests a small temple. The decoration of the bulkhead in the clear story is unfortunately shut out by the metal candelabra in the foreground. In the centre of the room a divan of reasonable proportions and richly upholstered may be seen. This is mounted with a metal candelabra stand, and upon the opposite side is fitted a folding desk where may be found note paper, envelopes and telegraph blanks. The room is furnished with ten upholstered easy chairs and two settees, leaning diagonally against the section bulkhead. The car is executed in mahogany, adorned throughout with elaborately carved ornaments. The ceiling is painted and adorned with relief ornaments in gilt. The upholstery is of rich pink plush studded and finished with cord and fringes. The carpets and hangings are in harmonious colors. The upper part of the side windows and the deck windows are filled with handsomely decorated and tinted leaded glass, in keeping with the surrounding features. The car is lighted by electric chandeliers, two of which are shown on the bulkhead panels. It is one of the most highly decorated and original designs that we have shown—a decided innovation.

One of the most elaborately decorated and artistically designed cars that we have seen, coming from outside of the palace car companies' works, is shown in Fig. 17. It is from the shops of the Barney & Smith Co. The clear story of this car bears a strong resemblance to the Romanesque, yet the seats suggest the Colonial. The decorations of the curtain rod, brackets with the Pintsch gas lamps, the bunk decorations and the wood work are all especially in keeping with one another. In fact the whole upper part of the car, which is best shown in the engraving, has a very pleasing effect.

For plain, delicate and simple decorations in a serviceable car, Fig. 18 is a good example. It is of the dining room of a Norfolk & Western private car built in 1890. The finish is in quartered oak of a conventional design common to American cars. The ceiling is of three-ply, curled maple veneer, and the decorations are in color and gold. The upholstering, drapery, table cover and carpet are of materials and color to harmonize with the rest. The decorations of the chairs even conform to those of the car itself. The lamps are No. 176 Hicks & Smith, a pattern seen in several other cars. Doors are used instead of portières. This car, when compared with the more elaborate interiors already described, indicates the growth in style and quantity of car decoration during the past four years. We may well regret the burdening of the interior of the car with such lavish ornamentation as is shown in Figs. 1, 5, 15 and 16, but the degree to which decoration has been carried without vulgarity, is truly marvellous. In Figs. 15 and 16 scarcely an inch of the interior's surface has escaped the tool of the sculptor or the brush of the artist, and yet this profusion does not offend the taste, except as an example of waste of human energy. It seems to us that the limits have been reached in this direction, and that the best cars of the future will be characterized by simplicity of decoration.

We are indebted to car builders whose work is illustrated for photographs from which the engravings were made, and to many others for a great number of photographs received, but which could not be used because there is a limit to the space and time in which a human being works.

Hopper-Bottom Gondola, Norfolk & Western Railroad.

The hopper-bottom gondola for coal, which is shown, is believed to have the essential feature of a first-class car, and the design has eliminated many of the faults peculiar to such cars. For example, the floor is sufficiently inclined to save shovelling. There is no part of the car body but that will discharge itself by gravity. The hopper is the full width of the car between side sills, and the doors are large enough to permit a prompt discharge of the largest lumps of coal. To have a clear way for coal, the intermediate and usual center sills are replaced by one heavy center sill or timber 9½x10 in., which is the only timber passing through or over the hopper between the side sills. Such a construction leaves four clear openings, 34x38 in. The sides are high and well braced, the corners bound inside and outside by corner plates, and the tops covered by iron plate securely lag-screwed throughout. The body truss-rods are carried out under the side sill and under the hopper, as shown. This gives a certain amount of lateral stiffness, besides sustaining the side sills and hopper.

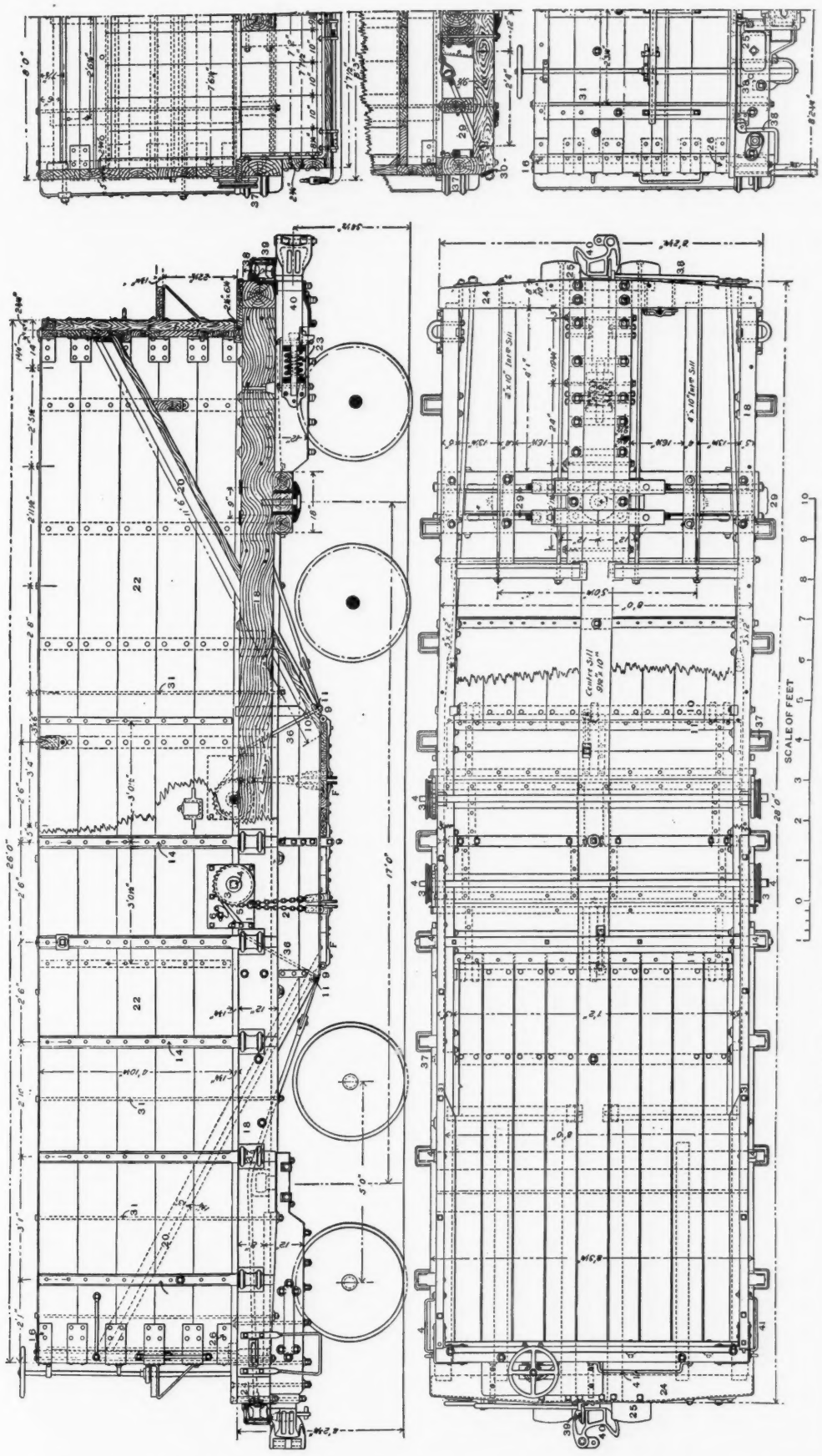
The hopper is also stiffened in the middle of the car by counter bolts passing through the center sills or timber. The sills are unusually heavy and they are reenforced by longitudinal tie-rods and corner tie-bolts. The end sill is 8x10 in., reenforced by an outside angle plate and further protected by dead blocks. The bolster consists of three pieces of oak with steel plates between, and it is further strengthened by two truss rods and saddles.

The car is very strong throughout, and there is but one thing that suggests itself as lacking, which is the modern practice of trussing the sides near the top. This is hardly a criticism in a car of such short length and thick sides, which may render side-trussing unnecessary; besides, the two opposite sides are securely tied together by cross tie-rods and struts.

The Norfolk & Western, like most other roads of to-day, employs the drop-door and chain-shaft in spite of the danger of spilling coal while the car is in transit and the loss of time required to close the doors and to open them when frozen. The number of doors for dumping coal cars that have been designed and patented, cannot be very closely estimated, yet with the exception of a few roads the chain shaft and drop-bottom door prevail to-day, although nearly every road in the country professes to be looking for something better.

This car is not peculiar to the Norfolk & Western Railroad. A very similar type is used on the Baltimore & Ohio road, and it bears some resemblance to the gondola cars of the New York, Lake Erie & Western, and a remote likeness to the Chicago, Burlington & Quincy cars. The

two latter have pyramidal hoppers, however. The capacity is 30 tons. The dimensions and general details may be understood from the drawing.



TWENTY-EIGHT-FOOT HOPPER-BOTTOM GONDOLA CAR, NORFOLK & WESTERN RAILROAD.

Supreme Court Decision on the Texas Railroad Law.

On May 26th the Supreme Court of the United States decided the suits of the railroads of Texas against that State which have been pending since 1892. The decision was prepared by Justice Brewer, and is unanimous. In substance it sustains the constitutionality of the law under which the Railroad Commission of Texas was instituted, but holds that the rates complained of in these cases were unreasonably low.

The Texas railroad law was passed in 1891, and may be found, in condensed form, in the *Railroad Gazette* of April 10, that year. The complaint of the railroads was in the form of suits entered by the Farmers' Loan & Trust Co., of New York, and other bondholders, this course having been taken to get the matter into the United States courts. The decision of Judge McCormick in the United States Circuit Court was reported in the *Railroad Gazette* of August 26, 1892, page 636, and was further discussed in the issue of Sept. 30, page 728. The suit now decided is that of the International & Great Northern, but the others are subject to the same decree. The case of the Texas & Pacific differed from the others in that it is a national corporation, but it was held that this did not exempt it from the operation of a rate law in the State through which it passed.

The decision is very long. It first recites the law section by section, almost without comment. Then it enters into the history of the case. No notice is taken of the first decree, which Judge McCormick granted in chambers at Dallas. Justice Brewer first takes up the question of jurisdiction. We are met at the threshold, he says, by an objection that this is in effect a suit against the State of Texas brought by a citizen of another State, and, therefore, beyond the jurisdiction of the Federal Court; but, so far from the State being the only real party in interest and upon whom alone the judgment effectively operates, it has, in a pecuniary sense, no interest at all. Going back of all matters of form the only persons pecuniarily affected are shippers and carriers.

Neither will the constitutionality of the statute, if that be conceded, avail to oust the Federal Court of jurisdiction. A valid law may be wrongfully administered by officers of the State, and so as to make the administration an illegal burden and exaction upon the individuals. (The case of Cunningham vs. Macon & Brunswick, 109 U. S., 446 and 452, is quoted.) . . . Whenever a citizen of a State may go into the State courts to defend his property against the illegal acts of its officers, a citizen of another State may invoke the jurisdiction of the Federal Court to maintain a like defense.

We need not, however, rest upon the general power of the Federal Court in this respect, for in the act before us authority is given for a suit against the commission to accomplish that which was a specific object of the present suit. Section 6 provides that "any dissatisfied railroad company or another party at interest may file a petition in a court of competent jurisdiction in Travis County, Texas, against said commission as defendants." The language of this provision is significant. It does not name the court in which the suit may be brought. It is not a court of Travis County, but in Travis County. The language differing from that which ordinarily would be used to describe a court of the State was selected, apparently in order to avoid the objection of an attempt to prevent the jurisdiction of the Federal Courts. The United States Circuit Court for the Western District is a court of complete jurisdiction in Travis County. A State can waive exemption from a suit. Were this in terms a suit against the State, the suit might be brought against it by name in any court of competent jurisdiction in Travis County.

In the famous Dartmouth College case (4 Wheat., 518) it was held that the charter of the corporation was a contract protected by that clause of the national Constitution which prohibits the State from passing any law impairing the obligation of contracts. The I. & G. N. R. R. is a corporation created by the State of Texas. The charter which created it is a contract which neither party can repudiate without the consent of the other.

If the charter had in terms granted to the corporation power to charge and collect a definite sum per mile for the transportation of persons or property, it would not be doubted that that express stipulation formed a part of the obligation of the State which it could not repudiate. Whether, in the absence of an express stipulation of that character, there is not implied in the grant of the right to construct and operate the grant of a right to enable the company to charge and collect such toll as will enable it to successfully operate the road and return some profit, is a question not as yet determined. It is at least a question as to the extent to which that contract goes, and one in which the corporation has the right to invoke the jurisdiction of the court, and if the corporation—a citizen of the State—has the right to maintain the suit for the determination of that question, clearly a citizen of another State, who has, under the authority of the laws of the State of Texas become pecuniarily interested, may invoke the judgment of the Federal Courts as to whether the contract rights created by the charter, and of which he is thus the beneficial owner, are violated by subsequent acts of the State in limitation of the right to collect tolls. . . .

Passing from the question of jurisdiction to the act itself, there can be no doubt of the general power of the State to regulate the fare and freight, and that this regulation may be carried on by commission. Such a commssion is merely an administrative board created by the State for carrying into effect the will of the State as expressed by its legislation. (Railroad commission cases, 116, U. S., 307.)

Specific objections are made to the act on the ground that by section 5 the rates and regulations made by the commission are declared conclusive, and that section 14 imposes excessive penalties, a practical denial of the railroad companies of the right of a judicial inquiry into the reasonableness of rates. The argument is, in substance, that railroad companies are bound to submit to the rates prescribed, until, in a direct proceeding, there has been a final adjudication that the rates are unreasonable, which final adjudication can not be reached for a long time; that meanwhile the failure to obey those regulations exposes the company, for each separate fare or freight exacted in excess of the prescribed rates, to a penalty so enormous as in a few days will roll up a sum far above the value of the property; that even if, in a direct proceeding, the rates should be adjudged unreasonable, there is nothing to prevent the commission from re-establishing rates, but slightly changed and still unreasonable, to set aside which requires a new suit with lengthy delay, and thus it is claimed that the railroad companies are tied hand and foot and bound to submit to whatever illegal, unreasonable and oppressive regulations may be prescribed by the commission. But it is enough to say, at least, so far as this case is concerned, that it is not to be supposed that the Legislature of any State, or a commission appointed under the authority of any State, will ever engage in a deliberate attempt to cripple and destroy the railroads. If in any case there should be a mistaken action on the part of the State or its commission, any citizen of another State interested can find relief in the Federal Court.

We do not deem it necessary to pass upon any of these specific objections, because any section prescribing penalties may be dropped from the statute without affecting the remaining sections, and if the rates established by the commission are not conclusive, they are at least prima facie evidence of what is reasonable and just.

For the purpose of this case it may be conceded that both of the clauses are unconstitutional, and still the great body of the act remains unchallenged—that which establishes the commission and empowers it to make reasonable rates and regulations for the control of the railroads.

It is not to be presumed that the Legislature was legislating merely to impose penalties, but the penalties and the provision as to evidence are merely an aid to the main purpose of the statute. We, therefore, for the purpose of this case, assume that these two provisions of the statute are open to the objections made to them. We do not mean to imply that they are so in fact, but simply that it is necessary to determine the matter.

The State commission has made a body of rates for fares and freights. The body of rates, as a whole, is challenged by the plaintiff as working a destruction of its rights. The defendant denies the power of the court to entertain an inquiry into that matter. . . . The province of the courts is not changed, nor the limit of judicial inquiry altered because the legislature instead of the carrier prescribes the rates. The courts are not authorized to revise or change the body of rates imposed by a legislature or a commission. They do not determine whether one rate is preferable to another, or what, under all circumstances, would be fair and reasonable as between the carriers and the shippers; they do not engage in any mere administrative work; but still there can be no doubt of their power and duty to inquire whether a body of rates prescribed by a legislature or a commission is unjust and unreasonable, and such as to work a practical destruction to rights of property, and if found so to be, to restrain its operation. In the Chicago, Burlington & Quincy vs. Iowa (94 U. S., 155); Peik vs. Chicago & Northwestern (94 U. S., 164), and Wabash vs. Illinois (118 U. S., 557, 569), there was no decision as to the extent of control, but only as to the right of control. This question came again before this court in railroad commission cases (116 U. S., 307, 331), and, while the right of control was affirmed, a limitation on that right was plainly intimated in the following words of the chief justice:

"It must not be inferred that this power of limitation or regulation is itself without limitation. Power to regulate is not a power to destroy, and limitation is not

equivalent to confiscation under pretense of regulating fares and freights. The State can not require a railroad corporation to carry persons or property without reward; neither can it do that which in law amounts to a taking of private property for public use without just compensation or without due process of law." . . . . "The legislature has power to fix rates, and the extent of judicial interference is protection against unreasonable rates." Budd vs. New York (143 U. S.,517), announces, nothing to the contrary.

These cases all support the proposition that while it is not the province of the courts to enter upon the merely administrative duty of framing a tariff, it is a part of judicial duty to restrain anything which, in the form of a regulation of rates, operates to deny to the owners of property invested in the business of transportation that equal protection which is the constitutional right of all owners of other property. There is nothing new or strange in this. It has always been a part of the judicial function to determine whether the act of one party—whether that party be a single individual, an organized body, or the public as a whole—operates to divest the other party of any rights of person or property.

The challenge in this case is of the tariff as a whole, and not of any particular rate. Our inquiry is limited to the effect of the tariff as a whole, and the decree must either condemn or sustain this act of quasi legislation. If a law be adjudged invalid the court may not in the decree attempt to enact a law upon the same subject which shall be obnoxious to no legal objections. The same rule obtains in a case like this. We pass then to the remaining question: Were the rates as prescribed by the commission unjust and unreasonable? The bill, it will be remembered, was filed by a second mortgagee. The railroad company was made a defendant and filed a cross bill. Each of these bills contains a general averment that the rates are unjust and unreasonable. That in the original bill, filed April 30, 1892, claims that the rates so charged and announced by said commission are unreasonably low and would result as nearly as can be estimated in a diminution of revenues of the International & Great Northern more than $200,000 per annum, and that the revenues so reduced would be insufficient to pay the interest upon the prior obligations, and the interest upon the second mortgage bonds, etc. We should hesitate to take the filing of the demurrers to these bills as a direct admission on the part of the defendants that the rates established by the commission are unjust and unreasonable. Yet it must be noticed that at first answers were filed tendering issue upon the matters of fact and testimony was taken, the extent of which, however, is not disclosed by the record. After that the defendants applied for leave to withdraw their answers and file demurrers. It is not to be supposed that this was done thoughtlessly. But one conclusion can be drawn from that action, and that is that upon the taking of their testimony defendants became satisfied that the particular facts were as stated in the bills, and that the conclusions to be drawn from such facts could not be overthrown by any other matters. Hence, if it appears that the facts stated in detail tend to prove that the rates are unreasonable and unjust, we must assume as against the demurrers that the general allegation heretofore quoted is true, and that there are no other and different facts, which, if proved, might induce a different conclusion, and compel a different result. What, then, are the special facts disclosed in the several bills?

The decision here states that the bonds of the road amounted to $15,000,000, and the stock to $9,750,000 both of which "were issued for and represent value." The road was unable to pay the interest on the bonds and the stockholders had never received any dividends. On the contrary they had paid an assessment of 12 per cent. which went for interest on the first mortgage bonds. Holders of these bonds had accepted certificates for half their interest. The second mortgage bondholders had funded their interest in third mortgage 4 per cent. bonds, and had agreed to a reduction of interest on their bonds. The road had been placed in the hands of a receiver.

The earnings for 1890 were $3,646,422, and the expenses, exclusive of taxes, 86 per cent. of this. In 1891 the result was about the same, expenses being 85 per cent. For the first three months of 1892 there was a deficit. The freight rate per ton per mile decreased gradually from 2.03 cents in 1884, to 1.33 in 1888. The next two years it was a trifle higher. The 825 miles of the road in Texas had cost $50,000 a mile, and could not be replaced for less than $30,000 a mile. The bill went on to aver that the road had always been operated economically and judiciously; there were seventeen officers receiving an average salary of $12.64 a day, and the other employees received an average of $2.01 a day. No unnecessary officers or employees had been kept in the service. All material had been bought at the lowest possible rates.

In the amendment to the cross bill filed in March, 1893, is given a table, showing the actual reductions in amounts received for the transportation of the different classes of goods under the operation of the new tariffs up to August 31, 1892, and amounting to $159,694, and also a table showing the per cent. of reductions as to different articles, varying from 5 per cent. on cement to 15.90 per cent. on grain in carloads. The bill also in general terms negatives the probability of any increase in amount of business to compensate for the reduction in rates, a negative sustained by the figures given in the amended bill as to the actual effect upon the receipts. It also contains a general averment that the rates on interstate business would be injuriously affected to an equal amount by reason of the reduction of rates on business within the State.

As against these acts the Attorney General of Texas presents a table showing alleged unjustifiable expenditures. He claimed that too much had been charged to "balance of income account;" but the Court holds that wherever this money came from, no interest was paid on the bonds during the years referred to, and concludes that this complaint must be based on a mere technicality of bookkeeping. For the year ending June 30, 1892, the Attorney General claims that the earnings were sufficient to pay fixed charges, $300,000 having been expended for improvements which he claims should not have been charged to expenses; but the Court says that he ignores statements made in the cross bill, which show that interest on bonds, which was not paid, would have exceeded all the apparent surplus.

The sum of $302,085.77 appears in the Attorney General's table under the description of "cost of road, equipment and permanent improvements, admitted to have been included in operating expenses," and it is added to the income as though it had been improperly included in the operating expenses; but there were no extensions of the road during that year, so that all of this sum was expended upon the road. Of this sum $113,212 went for rails, and there was not a dollar expended for rails except this. Now the purchase of these rails may be called permanent improvements or by any other name, but they are what is necessary for keeping the road in serviceable condition.

Other items in the table are for fencing, grading, bridging and culverts, masonry, bridges and trestles, buildings, furniture, fixtures, etc. As there are no extensions it is obvious that these expenditures were those necessary for a proper carrying on of the business required of the company. Certainly the mere title under which these expenditures are once stated is not sufficient to overthrow the facts so fully and clearly shown—that the stockholders have never received any dividends; that in order to meet interest on bonds they had to advance a million and over of dollars. Those are facts whose significance cannot be disproved by mere bookkeeping or classification of expenditures.

The Attorney General refers to the four parallel railroad lines and their competition, and to the fact that Texas had given 3½ million acres of land to this road as well as exemption from taxation for twenty-five years. Reference is also made to the business depression; but the Court cannot find that these facts have any appreciable bearing on the questions at issue. And if there has been depreciation of prices, will such depreciation uphold a compulsory reduction of the rates of transportation to such an extent that some of those who have invested their money in railroads receive no compensation therefrom?

Summing up, the Court says: This clearly appears: The cost of the railroad property was $40,000,000. It can not be replaced today for less than $25,000,000; there are $15,000,000 mortgage bonds outstanding against it, and nearly $10,000,000 of stock. The bonds and stock represent money invested in the construction of the road; the owners of the stock have never received $1 worth of dividends in return for their investment; the road was thrown into the hands of a receiver for default in payment of the interest on the bonds; the earnings for the last three years prior to the establishment of these rates were insufficient to pay the operating expenses and the interest of the bonds.

In order to make good the deficiency in interest the stockholders have put their hands in their pockets and advanced over a million of dollars. The supplies for the road have been purchased at as cheap a rate as possible. The officers and employees have been paid no more than is necessary to secure men of the skill and knowledge requisite to suitable operation of the road by the voluntary action of the company the rate in cents per ton per mile has decreased in ten years from 2.03 to 1.30, the actual reduction by virtue of this tariff in the receipts during the six or eight months that it has been enforced amounts to over $150,000. Can it be that a tariff which under these circumstances has worked such results to the parties whose money built this road is other than unjust and unreasonable? Would any investment ever be made of private capital in railroad enterprises with such as the proffered results?

It is unnecessary to decide, and we do not wish to be understood as laying down as an absolute rule that in every case a failure to produce some profit to those who have invested their money in the building of a road is conclusive that the tariff is unjust and unreasonable. And yet justice demands that every one should receive some compensation for the use of his money or property, if it be possible, without prejudice to the rights of others. There may be circumstances which would justify such a tariff; there may have been extravagance and a needless expenditure of money; there may be a waste in the management of the road; enormous salaries, unjust discrimination as between individual shippers, resulting in general loss. The construction may have been at a time when material and labor were at the highest price, so that the actual cost far exceeds the present value; the road may have been unwisely built in localities where there is not sufficient business to sustain a road. Doubtless, too, there are many other matters affecting the rights of the community in which the road is built, as well as the rights of those who have built the road. . . .

The rates voluntarily fixed by the company have been for ten years steadily decreasing, until the aggregate decrease has been more than 50 per cent.; under the rates thus voluntarily established, the stock, which represents two-fifths of the value, has never received anything in the way of dividends, and for the last three years the earnings have been insufficient to pay the interest on the bonded debt, and the proposed tariff as enforced will so diminish the earnings that they will not be able to pay one-half the interest on the bonded debt. This, in the absence of any satisfactory showing to the contrary, will sustain a finding that the proposed tariff is unjust and unreasonable, and a decree reversing it being put in force. It follows from these considerations that the decree as entered must be reversed in so far as it restrains the railroad commission from discharging the duties imposed by this act, and from proceeding to establish reasonable rates and regulations; but must be sustained so far as it restrains the defendants from enforcing the rates already established. The costs of this court will be divided.

The Kinsman Block System.

The Kinsman Block System Co., of New York City, has now had its apparatus in successful operation on the Evanston Division of the Chicago, Milwaukee & St. Paul for several months, and we show herewith a drawing which gives a good idea of the arrangement of electrical apparatus and circuits by which the system is operated there. The construction and operation of the apparatus used by the Kinsman Company was described in the *Railroad Gazette* of Sept. 23, 1892. It is essentially an automatic audible block signal system, and in addition, a means of stopping trains without any signals whatever. As operated on the Chicago, Milwaukee & St. Paul there are no visual signals used, though such signals may readily be worked in connection with these, or the audible may be used as an auxiliary to visual signals.

The division of road referred to is equipped from Evanston to Fullerton avenue, 9 miles, and there are 21 passenger trains each way daily, besides one or more freight trains. All the locomotives running on this branch of the road are equipped with the necessary apparatus. The road is divided into short block sections, and preceding the entrance to each section, two electrical rails like guard rails, are fixed upon the ties as shown in the diagram, Fig. 1. The danger signal is given and the

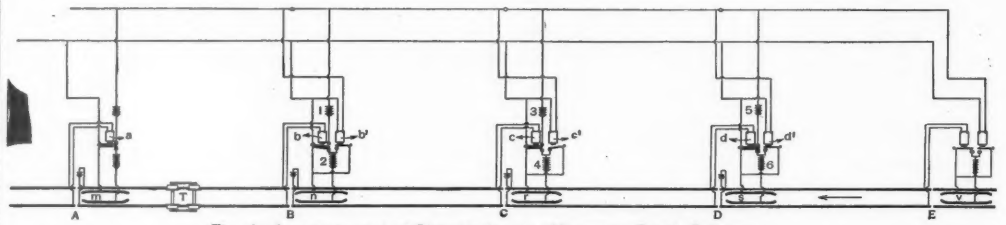


Fig. 1—Arrangement of Circuits for the Kinsman Block System.

stopping apparatus actuated by an electro-magnet in the cab of the locomotive, which is operated by means of a battery fixed at the side of the road, the current from which reaches the electro-magnet through the electrical rails and suitable connections on the engine. The arm or brush for making the connections is fixed to the forward truck of the locomotive and runs in the flangeway, so that it will rub against each guard rail as the engine passes it. The experience of the Kinsman Company goes to show that this is the only suitable position on the engine for carrying such a contact-piece.

The closing of the electro-magnet in the cab, besides giving the audible signal to the engine man, shuts off the

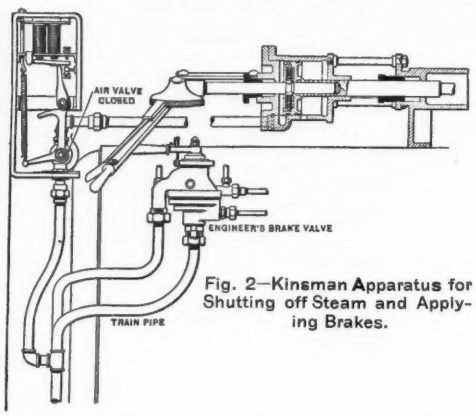


Fig. 2—Kinsman Apparatus for Shutting off Steam and Applying Brakes.

steam and applies the air-brakes. The way in which this is done is shown clearly in Figs. 2 and 3. The lifting of the armature releases a dog which falls and opens a valve, admitting air from the train pipe of the brake system to the cylinder which surrounds the spindle of the throttle lever. This spindle is in two parts, so that when the piston is pushed forward, shutting off steam, the lever remains stationary. After the piston passes the port E, the air escapes through that opening, thus reducing the air pressure in the train pipe and applying the brakes on the train. By properly graduating the size of the opening, E, the brakes may be applied with any desired degree of mildness.

When the throttle is worked by hand, the two parts of the spindle, one of which surrounds the other like a sleeve, are held together by a series of radial pins within the piston, the latter being fixed to the outer part of the

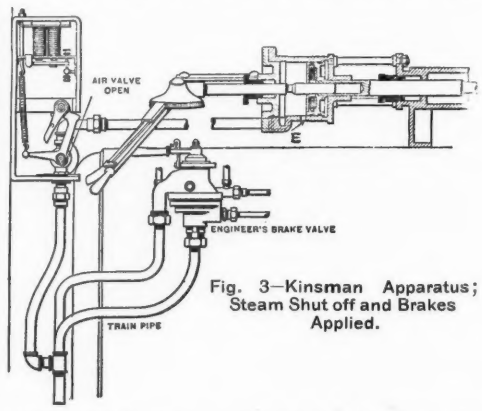


Fig. 3—Kinsman Apparatus; Steam Shut off and Brakes Applied.

spindle. The pins are pressed into the neck in the smaller spindle by strong spiral springs as shown in the cut.

This system is operated by a track circuit, arranged the same as with visual automatic signals. In Fig. 1, T represents a train in section A B. The presence of this train demagnetizes relay *b*, and the armature, being down, connects battery 2 with the electrical rails, so that if a following train runs over the rails the stopping apparatus and the audible signal will be operated. The opening of relay *b*, also opens the circuit through battery 1, which opens relay at station C, thus closing battery 4 so that it will be ready to stop any approaching train before it reaches *b*. Thus C acts as a distant signal and B as a home. In clear sections the battery (as, for instance, battery 6) is connected to only one of the electrical rails and so produces no action on a passing engine.

The Kinsman Company has recently received patents for an arrangement by which the relays *a*, *b*, *c*, *d*, instead of

opening and closing the circuit which runs from the battery (2, 4, 6), to the electrical rails, and thence to the engine, only reverse its polarity, and there is always either a positive or a negative current ready to actuate the apparatus on the engine. By this means the safety indication can be made positive instead of negative, thus meeting the most radical criticisms of this system. When the track circuit is closed, so as to hold relay *d* closed, indicating that the line is clear, the armature of the relay is in a position to send a negative current to the right hand rail, and, by means of a polarized electro-magnet on the engine, to ring a certain bell indicating all-clear; while the presence of a train in the section, opening relay *d*, will operate to send a positive current to the right hand rail, and, by means of the polarized electro-magnet, ring the danger bell and operate the stopping apparatus. Thus the absence of an audible signal on passing the electrical rails will warn the engineman that the apparatus is out of order.

The Great Venezuelan Railroad.

The railroad between Caracas and Valencia recently opened in Venezuela, promises much for the development of that country, and is remarkable for the engineering difficulties overcome. It is the subject of an article which recently appeared in *Harpers' Weekly*. It is called the Gran Ferrocarril de Venezuela, and extends from Caracas southwest and west to Valencia, crossing the Coast Range Mountains. The distance by rail is about 113 miles, but the direct distance between the two towns is less than one-half of that. The gage is 3 ft. 5 in. The road was built entirely by German capital, and of German material. The concession was secured by Krupp during the administration of Guzman Blanco. He, however, seems to have assigned his interest in the concession. A company was formed in Germany to carry on the construction, two German banks subscribing for the entire capital. The Venezuelan government gave a liberal concession, appreciating the importance of uniting the important interior town of Valencia by rail connection with Caracas, the national capital. The government guarantees 7 per cent. interest on $125,000 a mile through the mountain district between Caracas and Cagua, and on $110,000 a mile between Cagua and Valencia. But this guarantee is not quite so liberal as the figures indicate. The road for more than half of its total length is located through the Coast Range Mountains, and the construction-work was heavy and costly. Several miles on the Bigonia section cost nearly $500,000 a mile, there being numerous long tunnels and heavy bridges and viaducts. The construction work of this part of the line was in charge of an American engineer, Mr. Louis Frost, of New Orleans, as contractor.

From Caracas the line gradually ascends to Los Teques, 4,021 ft. above the sea. The tunnel at this point is 900 ft. long, and the longest on the road. From the summit there is a descending grade of 2 per cent. to the valley of the Rio Tuy. At Las Tejerias, the open valley is reached. From La Victoria to Valencia the road presents no special engineering difficulties. Between La Victoria and Caracas there are 86 tunnels and 200 bridges and viaducts. The mountainous character of the road has necessitated the construction of a solidly built line. The rock-road bed through the mountain is ballasted with coarse river sand. The ties are of wrought iron, of German manufacture. The equipment is all of German construction. Locomotives weighing 35 tons are used. The cars are built on the American pattern. The road passes through a country rich in minerals, and the agricultural section is very fertile, growing coffee, sugar and cacao. The line was six years in building. Work was stopped during the last revolution, but the last rail was laid a few months ago in the presence of President Crespo, and many of the government officials, General Manager C. Plock, and others of the resident directors. The cost is stated to be over $15,000,000.

At Caracas the road connects with a branch running to the port of Guaira, while at Valencia another branch connects with the port of Puerto Cabello. Both of these roads are under English control.

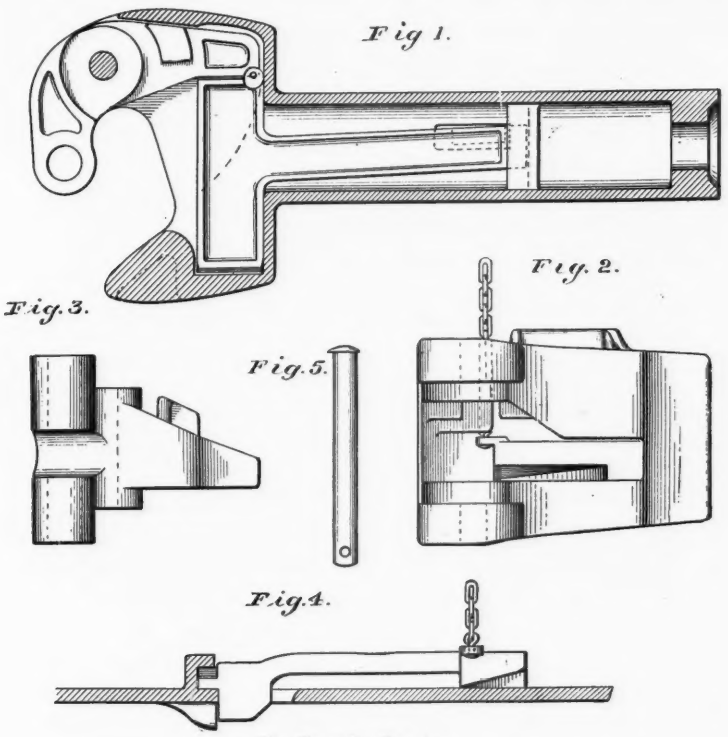
In the *Railroad Gazette* of April 13 there appeared an article on this road giving additional facts to those stated above.

The Enos Car Coupler.

Our illustrations show the design and application of the Enos coupler, a new coupler of the vertical plane type built on the contour lines of the Master Car Builders' Association.

This coupler is strongly and simply constructed and shows little liability of getting out of order. The lock is of the gravity type, the form being shown by the T-shaped piece with chain attached in fig. 6 also in fig. 2. The stem of this locking bar runs back into the shank of the coupler while the end A, to which the chain is attached, serves as a bearing for the tail of the knuckle. The opposite end of the bar bears against the walls of the coupler head, which is so built and strengthened as to properly receive it.

The upper side of the tail of the knuckle is provided with a projecting lug, which engages with a corresponding rib on the upper wall of the head and serves to take the pull in case the knuckle piece should be broken or lost out.



The Enos Car Coupler.

The coupler can be arranged to unlock either from the upper side of the head or from the under side of the shank. In the first case the end of the locking bar A, against which bears the tail of the knuckle, is raised by means of the chain which passes upward through the hole D in the upper side of the head. The end E of the locking bar rests in a socket cast in the shank to receive it,

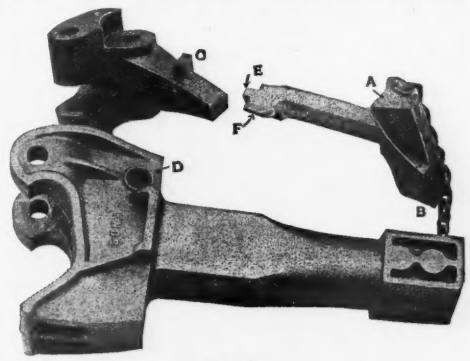


Fig. 6.

while the projecting lug F extends downward through a hole on the lower side of the shank as shown in figs. 7 and 4. The lug F is so located with respect to the bearing point of the lug E, that an upward pressure on F will raise the end A of the locking bar and allow the tail of the knuckle to swing out.

Fig. 8 shows an arrangement which permits the bar to be locked or unlocked either from the ground in the usual manner or from the top of the car. It will be observed that the upper end of the rod extending upward to the roof of the car has a hook by means of which the bar can be locked open or released when desired either from the top of the car or from the ground.

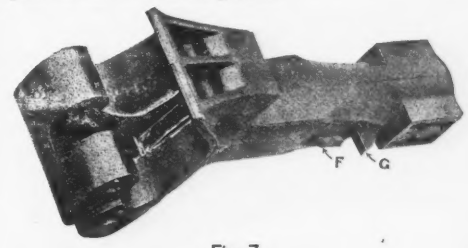


Fig. 7.

Another feature of the coupler is the means provided for unlocking the coupler in case the tail bolt or strap breaks, and preventing the bar from being thrown on the track. This is effected by the lug F, which, when the coupler is pulled far enough out, strikes the carrier iron and unlocks the coupler. The lug G, which is cast on the under side of the shank resists any remaining tendency to fall or pull out.

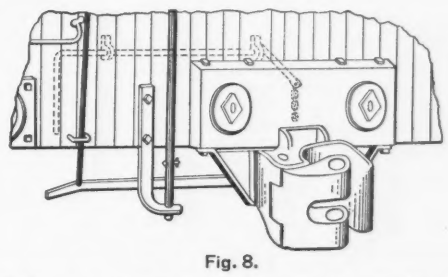


Fig. 8.

The bar or body of the coupler is made of malleable iron and the knuckle of wrought steel.

Mr. W. K. Jewett, Secretary and Treasurer of the Windsor Locks Steel Co., of Bridgeport, Conn., controls the manufacture and sale of the coupler.

The Minnesota Anti-Scalper Law.

On May 25 the Supreme Court of Minnesota rendered a decision on the case of the State of Minnesota vs. C. E. Corbett, which upholds the constitutionality of the anti-scalper law, passed at the last session of the legislature. The main points of the opinion are as follows:

The defendant was indicted for selling on Oct. 13, 1893, a ticket of the Northern Pacific from St. Paul to Little Falls, contrary to the provisions of Section 2, Chapter 66, laws of 1893. . . . We shall confine ourselves to the consideration of the objections raised to the validity of that statute.

That the transportation of passengers by common carriers is a proper subject of police regulation by the State is unquestioned. And if a business itself is the subject of police regulation then so are all its incidents and accessories. That the matter of the issue and transfer of tickets as evidence of the contracts of the carriers is an incident and accessory of the business needs no argument.

And where a business is a proper subject of the police power the legislature may, in the exercise of that power, adopt any measure, not in conflict with some provision of the constitution, that it sees fit, provided only they are such as have some relation to and some tendency to accomplish the desired end, and if the measures adopted have such relation or tendency the courts will never assume to determine whether they are wise or the best that might have been adopted.

Furthermore, courts are not at liberty to declare a statute unconstitutional because in their opinion it is opposed to the fundamental principles of republican government, unless those principles are placed beyond legislative encroachment by the constitution, or because it is opposed to a spirit supposed to pervade the constitution, but not expressed in words, or because it is thought to be unjust or oppressive, or to violate some natural, social or political rights of the citizen, unless it can be shown that such injustice is prohibited or such rights are protected by the constitution.

Except where the constitution has imposed limitations upon the legislative power it must be considered as practically absolute, and to warrant the judiciary in declaring a statute invalid they must be able to point out some constitutional limitation which the act clearly transcends. [Here the Court recites the evils of scalping, such as encouragement of cheating and employment of scalpers by railroads to evade rate laws.]

Counsel for the defendant seems to assume that tickets are vendible chattel property which are the legitimate subject of barter and sale, and that this statute is designed to be a "license law." With these two premises assumed the task of successfully assailing the validity of the act is a very easy one. But, while a "railroad ticket" is in one sense property, yet it is not a chattel. It is merely the evidence of the contract of the carrier. Treating it as the contract itself it is in the nature of a chose in action. No one with whom a carrier makes such a contract has any inherent constitutional right to insist that it should be assignable. At common law all choses in action were non-assignable, and if the legislature had deemed it necessary, in order to prevent the supposed evils, to provide that all transportation tickets should be non-transferable, or even to prohibit the issue of tickets altogether, and require carriers of passengers to collect fare in cash, we fail to see why they had not the power to do so.

The act has not the first element of a "license law," in the common meaning of the term. It must be borne in mind that these tickets are the contracts, or evidences of the contracts, of the carriers, hence in the nature of things can, in the first instance, be issued or sold only by the carriers themselves, who, as a matter of course, have the exclusive right to appoint their own agents for that purpose. Now what the act provides is that the carriers shall only issue or sell their tickets through agents appointed in a particular manner, and the evidence of whose appointment has been authenticated by certain formalities. While the certificate of a compliance with these requirements, issued by the State, is called a

"license," yet it is merely the evidence of the appointment of the agent, its purpose being to secure and preserve public written evidence of that fact so as to prevent evasions of the law, and to enable every one who buys a ticket to ascertain whether the person with whom he is dealing actually represents, and has authority to bind the carrier. The agent is given no authority to sell or deal in tickets of other carriers, but only authority to sell the tickets of the carrier appointing him and providing him the certificate of such authority.

So far from granting any special privileges to the carrier it imposes a burden upon him; first, by limiting his right to issue or sell tickets to agents provided with a certificate from the State of their authority, and second, by requiring him to repurchase or redeem unused tickets.

The fact that the purchaser of a ticket is prohibited from selling to whom he pleases does not "deprive him of his property without due process of law." The disposition of property may always be limited or regulated where public interests so require. The ticket is not destroyed or taken from the holder, nor is his right to ride on it at all limited. The only limitation is upon his right to transfer it. If he wishes to ride on it, which is the purpose for which a ticket is presumably bought, he can do so; but if he does not use it his only course is to require the carrier who issued it to redeem it. As already suggested, a man has no constitutional right to insist that these contracts for transportation shall be transferable, and if the legislature had seen fit to declare that they should not be, and that they could only be used by the party to whom they were originally issued they might have done so, even without making any provision at all for their redemption by the carrier if not used. This might not be true as to tickets, by their expressed or implied terms transferable, purchased before the passage of the act; but as to the tickets issued and purchased after that it is unquestionably true, for the statute becomes a part of the contract expressed in the ticket, and is inherent in the property in it.[1]

In Indiana and Illinois the courts have upheld statutes similar to the one under consideration in all material respects except that they provide that the acts shall not prohibit any person, who has purchased a ticket from any agent, authorized as by the act provided, with the bona fide intention of traveling upon the same, from selling it to any other person.[2]

In these cases the courts lay some stress upon this provision. But we are unable to see how the absence of it affects the validity of the act, or how, at least, as to tickets issued after its passage, it deprives a person of his property "without the process of law." The law may, in that respect, be more drastic, but if the legislature thought that such an exception would open the door to invasions of the law, and that the evils aimed at could be effectually remedied only by absolutely prohibiting any sale of tickets within the State except by the carrier himself, through his agents authorized in the manner provided, we think it was competent for them to so declare.

Neither is there anything in the objection that while the act prohibits the sale of any tickets except in the manner prescribed, it only provides for the redemption of unused tickets of railroads or steamboats situated or operated in whole or in part within the State.

This limitation of the provisions as to redemption may have been because of the supposed inability of the State to compel redemption by foreign or non-resident steamboat or railway companies. But, as the sale of all tickets might have been prohibited without any proviso for their redemption, the act does not deprive the holder of a ticket of a non-resident carrier simply because it leaves him, in case he does not use it, to such remedies, if any, as may be given him by the law of the domicil of the carrier.

Section 5 of the act makes it the duty of a carrier within the State to redeem tickets sold by it in "any manner," no matter whether sold within or without the State. What has been said fully covers the first. There is clearly nothing in the objections that the act unlawfully interfers with interstate commerce. The law is not a revenue law. It is a mere police regulation of the sale and transfer of tickets, designed to protect the public from frauds, and its interference, if any, with interstate commerce is purely incidental and accidental. The grant of power to congress to regulate interstate commerce was never designed to and does not at all interfere with police power of the States to promote domestic order, to prevent crime and to protect the lives and property of its citizens, although such regulations may indirectly operate upon and affect interstate commerce. Such regulations are valid in spite of their operation on commerce, and the right to psss them does not originate from any power in the State to regulate commerce. The books are so full of cases to this effect that the citation of authorities in support of the proposition is unnecessary.

Neither is there anything in the objection to section 7. Even if it should be declared wholly invalid, on the objection of an incorporated carrier, it would not affect the validity of the balance of the act.

We have endeavored to give this case the consideration which its importance deserves, and are not able to see that any of the objections urged against the validity of the act are well founded. With the policy or wisdom of it we have nothing to do.

The decision is by Judge Mitchell; Judges Buck and Canty absent.

[1] Ogden vs. Saunders, 12 Wheat., 213.

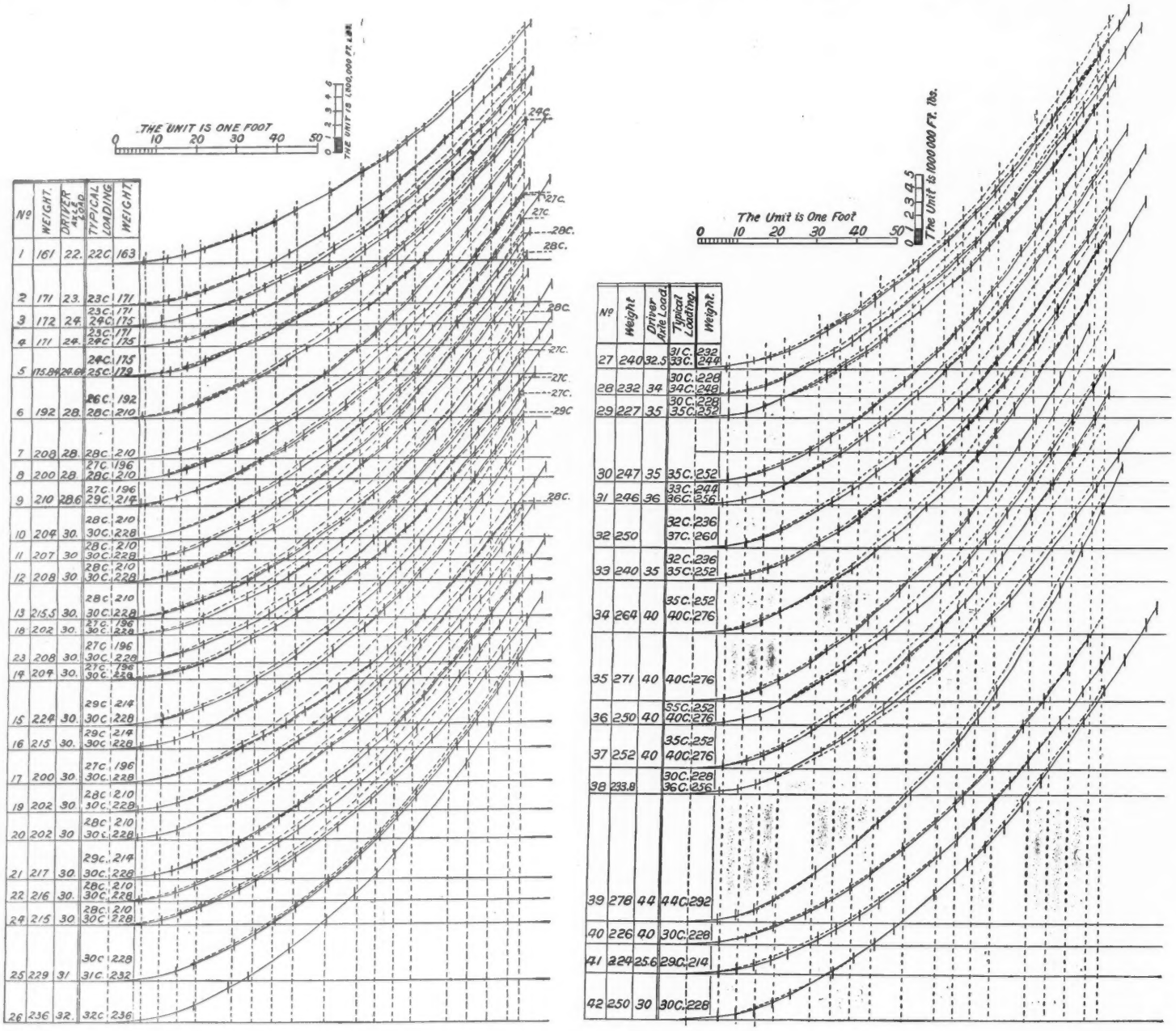
[2] Fry vs. State, 63 Ind., 552; Burdick vs. The People, N E. Rep., 948.

Present Practice in Specified Loadings for Railroad Bridges.

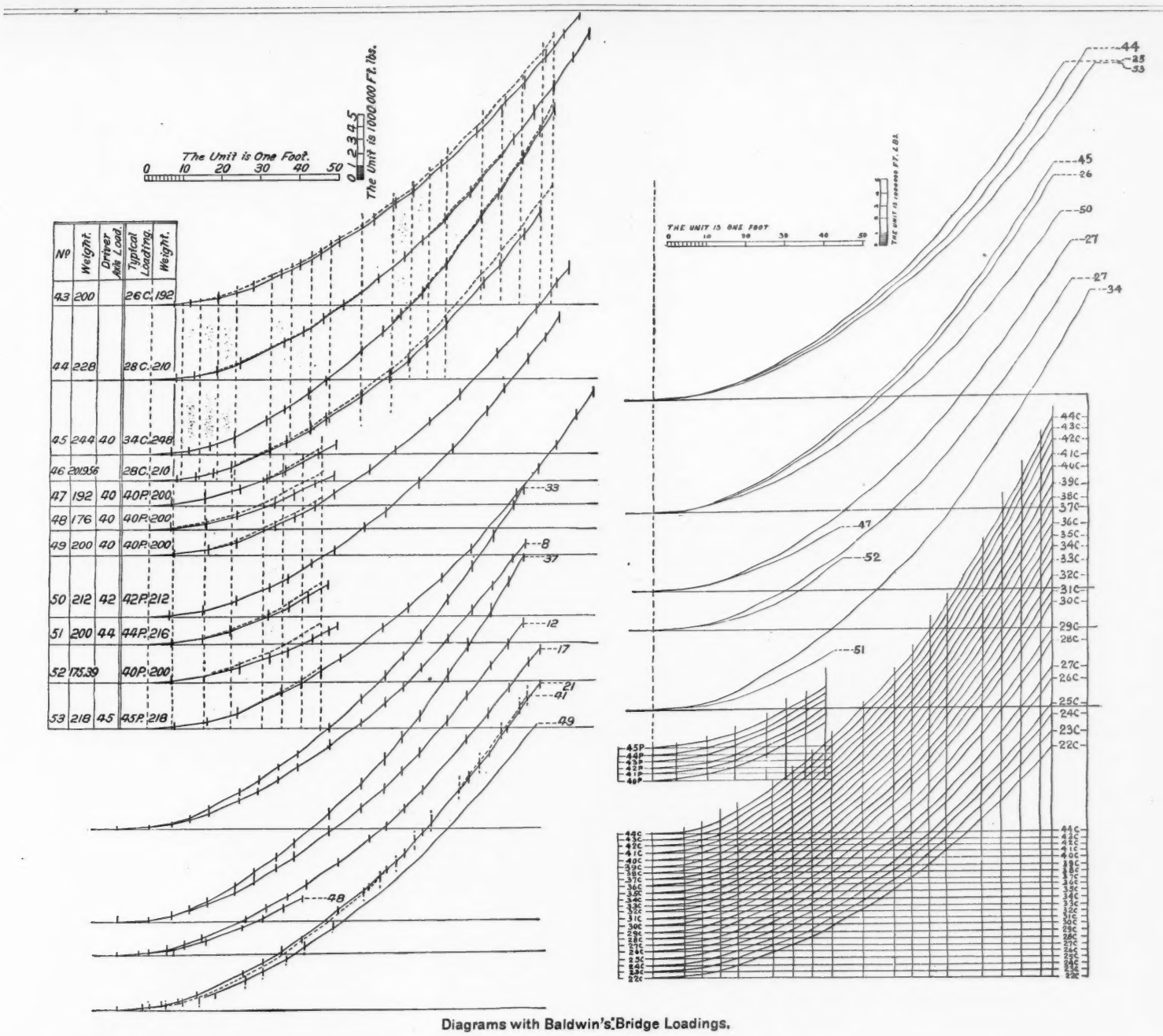
BY WARD BALDWIN, M. AM. SOC. C. E.

Continued from page 386.

These specified loadings will be compared with the typical loadings given in Table II, which latter loadings are derived from the specified loadings by using with a given driver load the heaviest pony truck and tender loads that are coupled with the given driver load in the specified loadings. The spacings chosen for the loads, while not the smallest to be found in the specified loadings, are approximately so, and are such that the total lengths of the two engines and tenders of the specified loadings are, with four exceptions, equal to or greater than the length of the typical loadings. These four exceptionally short loadings are Nos. 2, 7, 30 and 35. It will be seen by the diagrams that the stress effects of these loadings are almost exactly identical with the stress effects of the typical loadings having corresponding driver loads. The argument in favor of such heavy loads for the pony truck and tender as are assumed in the typical loadings in Table II is that these loads have already been used with the corresponding driver loads in some instances, and are liable to be used with the same driver load on those roads where at present the loads on the pony truck and tender are lighter. The consolidation engine as a type is used in so large a majority of the specified loadings that it seems reasonable to adopt it as the proper form for the typical loadings. The miscellaneous collection of loadings in Table I is largely the result of the independent action of railroad engineers in selecting either loadings whose dimensions correspond very closely with those of the rolling stock used on their respective roads, or loadings which will, in their opinion, cover all probable future increase in the weight of trains. The natural consequence of such independent selection has been that the types have been multiplied so that the loadings express almost every shade of opinion as to what the dimensions of a specified loading should be. The objections to this lack of agreement in the dimensions of the specified loadings are that the labor, and, therefore, the expense of the computation of bridges is made very great,



Diagrams with Baldwin's Bridge Loadings.



Diagrams with Baldwin's Bridge Loadings.

while the supposed advantage in having the specified loading correspond exactly with the engines in use is often destroyed by the introduction on the road of a new engine differing slightly in its dimensions from that used in the specifications. This is a common occurrence. The problem then presented to the engineer is whether the new locomotive will produce greater stresses than the specified loading. This comparison might to advantage be primarily carried a step further, and a loading having generally adopted dimensions selected which would produce substantially the same stresses as the actual loading. Such a practice would doubtless commend itself to all engineers, provided a set of loadings could be devised that would closely cover the ground in detail now covered by the specified loadings; and, provided an easy method of making the comparison above indicated could be found. The typical loadings in Table II appear to fulfill the first condition fairly well, and it will be shown that the comparison of the stress effects of the different loadings may be very readily made by means of the "moment lines" of the loadings. The method of drawing these moment lines was explained in an article published by the writer in the Engineering News, Vol. xxii, page 296, and is briefly as follows:

In Fig. 1, at any arbitrary point M on the horizontal line AM erect a vertical; on this vertical lay off M 1 equal to the moment of P_1, about M; lay off M 2 equal to the sum of the moments of P_1 and P_2, about M; lay off M 3 equal to the sum of the moments of P_1, P_2, and P_3 about M, etc. Then join A with 1; join the point *b* (where this line crosses P_2) with 2; join the point *c* (where this line crosses P_3) with 3, etc. Then the broken line A *b c d e f* 6 is the "moment line," and the vertical ordinate measured from AM to any point of this line is the sum of the moments of all the loads to the left about the given point. Suppose now a span GH to have the loading placed upon it in the position shown in Fig. 1, then EH is the sum of the moments of all the loads on the span about H; and the reaction at G is $\frac{EH}{GH}$. The bending moment at any point of the span as K is equa to ⟨ the left hand reaction times GK——the sum of the moments about K of the loads between G and K ⟩ $= \frac{EH}{GH}$ GK—NK. But by similar triangles $\frac{EH}{GH}$GK = LK ∴ the bending moment at K is equal to LK—NK=LN. It follows that if for a given position of the loading points on the moment line vertically over the ends of the span are joined by a straight line, called the "closing line," the bending moment at any point of the span is equal to the vertical ordinate between this closing line and the moment line at the given point. This property of the "closing line" was published by Mr. W. H. Scheurmann, C. E., in the Proceedings of the Missouri Association of Surveyors and Civil Engineers of 1886. If P is off of the span, the ordinates are measured from *b* 1 instead of from AM; if P_1 and P_2 are off of the span, the

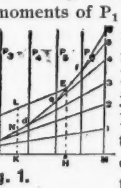


Fig. 1.

TABLE II.—TYPICAL LOADINGS.

Single Load.	Designation.		8′	4.5′	4.5′	4.5′	9′	5′	5′	5′	8′	8′	4.5′	4.5′	4.5′	9′	5′	5′	5′	3′
29.3	22 C.	15	15	22	22	22		15	15	15	15	15	22	22	23		15	15	15	15
30.7	23 C.	15	15	23	23	23		16	16	16	16	15	23	23	23		16	16	16	16
32	24 C.	15	15	24	24	24		16	16	16	16	15	24	24	24		16	16	16	16
33.3	25 C.	15	15	25	25	25		16	16	16	16	15	25	25	25		16	16	16	16
34.7	26 C.	16	16	26	26	26		18	18	18	18	16	26	26	26		18	18	18	18
36	27 C.	16	16	27	27	27		18	18	18	18	16	27	27	27		18	18	18	18
37.3	28 C.	18	18	28	28	28		20	20	20	20	18	28	28	28		20	20	20	20
38.7	29 C.	18	18	29	29	29		20	20	22	22	20	29	29	29		20	20	22	22
40	30 C.	20	20	30	30	30		22	22	22	22	20	30	30	30		22	22	22	22
41.3	31 C.	20	20	31	31	31		22	22	22	22	20	31	31	30		22	22	22	22
42.7	32 C.	20	20	32	32	32		22	22	22	22	20	32	32	32		23	22	22	22
44	33 C.	20	20	33	33	33		23	23	23	23	20	33	33	33		23	23	23	23
45.3	34 C.	20	20	34	34	34		23	23	23	23	20	34	34	34		23	23	23	23
46.7	35 C.	20	20	35	35	35		23	23	23	23	20	35	35	34		23	23	23	23
48	36 C.	20	20	36	36	36		23	23	23	23	20	36	36	36		23	23	23	23
49.3	37 C.	20	20	37	37	37		23	23	23	23	20	37	37	36		23	23	23	23
50.7	38 C.	20	20	38	38	38		23	23	23	23	20	38	38	38		23	23	23	23
52	39 C.	20	20	39	39	39		23	23	23	23	20	39	39	39		23	23	23	23
53.3	40 C.	20	20	40	40	40		24	24	24	24	20	40	40	40		24	24	24	24
54.7	41 C.	20	20	41	41	41		24	24	24	24	20	41	41	40		24	24	24	24
56	42 C.	20	20	42	42	42		24	24	24	24	20	43	43	43		24	24	24	24
57.3	43 C.	20	20	43	43	43		24	24	24	24	20	44	43	43		24	24	24	24
58.7	44 C.	20	20	44	44	44		24	24	24	24	20	44	44	44		24	24	24	24

PASSENGER ENGINES.

Designation.		6′	8′	7′	8′	5′	5′	5′
4 40 P	20	20	20	40	40	20	20	20	20
41 P	20	20	20	41	41	20	20	20	20
42 P	20	20	20	42	42	22	22	22	22
43 P	20	20	20	43	43	22	22	22	22
44 P	20	20	20	44	44	22	22	22	22
45 P	20	20	20	45	45	22	22	22	22

ordinates are measured from *c* 2 instead of from AM, etc. If the head of the loading P_1, is at the section at which the shear is to be found, the shear is the left hand reaction and equals $\frac{EH}{GH'}$, or for any two loadings it is proportional to the ordinate EH. If some of the loads are to the left of the point at which the shear is to be found, the ordinate EH is no longer exactly proportional to the shear, but it will still be a relative measure of the shear if all the loads in the two loadings compared bear the same ratio to each other, or if the loads to the left of the point be the same in the two loadings. In any case EH is an exact measure of the left hand reaction, and is therefore very approximately in practical cases a measure of the shear. Since the ordinate LN is an exact measure of the bending moment, and EH is a close measure of the shear near the head of the train, it follows that any two loadings which have moment lines agreeing closely with each other will produce nearly the same stress effects. To make a detailed comparison of two loadings by means of their moment lines it would be necessary to compare the ordinates to the moment lines measured from *b*2, *c*3, etc., as well as the ordinates measured from A M; and also the ordinates measured from various closing lines. The general conclusion, however, as to whether two loadings are substantially equivalent may be drawn from a comparison of the moment lines laid off from the base A M. It may be true in some cases that the lighter loading has at some point a heavier concentration than exists at any point of the heavier loading, and that the local effect of the lighter loading for very short spans may therefore be greater than the effect of the heavier loading. Thus, the diagrams given further on show that in every case where passenger engines are used they have less effect for ordinary spans than the consolidation engine used in the same specifications. Still the heavier drivers of the passenger engine will cause a greater panel load and greater stresses in the stringers than the consolidation engine when the panels are very short. This might be determined by scale from a detailed study of the diagrams drawn to a larger scale, but it is more conveniently determined analytically, as is shown further on. The diagrams given here represent the moment lines of all the loadings in Table I, and superposed on these are the moment lines of the typical loadings in Table II. The full lines belong to the loadings of Table I; the dotted lines belong to the loadings of Table II. The computations of the quantities used in drawing these moment lines were made independently by Mr. J. B. Strauss, C. E., of the Brackett Bridge Co., of Cincinnati, and by Mr. Frank H. Constant, C. E., formerly with the King Bridge Co., and now associated with Mr. Frank C. Osborn, of Cleveland. Some of the computations were also made by Mr. H. E. Warrington, C. E., Prin. Asst. Engr. C. N. O. & T. P. Ry. Co. In the diagrams the first column gives the number of the specified loading as assigned in Table I; the second column gives the total weight of one engine and tender; the third column gives the driver axle load when all axle loads are the same; the fourth column gives the designation of the typical loading whose moment line is superposed on that of the specified loading; the fifth column gives the weight of one engine and tender of this typical loading. Where two typical loadings are compared with one specified loading the typical loading given first in Column 4 is the one whose moment line agrees most closely with that of the specified loading. These figures show to what typical loading the specified loading is closely equivalent. The double comparison is made in a number of cases in order to show how far the different specified loadings differ from the typical loadings having the same driver loads. The moment lines of the several loadings specified by a single road are also compared by superposition of their moment lines.

An extended discussion of these diagrams seems superfluous as they show clearly the relations that it is desired to bring out. It may be noted that there are many instances of close agreement between the specified loadings, as for instance, Loads 13, 18 and 23 have the same spacing, the engines in 19 and 20 are exactly alike, and the loads in 18 are the same as in 19 and 20, while the spacings are only slightly different; that there are 14 different consolidation engines with 30,000 lb. driver loads; that the stress effects of the mogul, decapod and 10-wheel engines correspond very closely to the stress effects of the typical consolidation engines, with which their moment lines are compared; that Loads 48, 47, 52 and 51 will not produce as great stresses as Loads 17, 27, 27 and 34 respectively, in any except the shortest spans; that of Loads 21, 41 and 49, which are specified by one road, 49 can produce greater stresses than 21 and 41 only in the case of a very short span, while 21 and 41 are so nearly alike in their stress effects that they can both be replaced by 29C without any sacrifice of substantial accuracy; that of Loads 25, 44 and 53, which are all specified by one road, 25, will produce the greatest stresses in all cases except in case of very short spans, where the greater driver loads of Loading 53 may produce the greatest stresses; that of Loadings 26, 45 and 50, which are all specified by one road, 45, will produce the greatest stresses in all cases except in case of very short spans, where the greater driver loads of Loading 50 may produce the greatest stresses; that the use of any more of the passenger engine loadings specified than the driver loads is unnecessary.

To determine the limits of span within which the passenger engine drivers produce greater stresses than the consolidation engine, suppose the spacing is as in Table II, and let P be the driver load for a passenger engine, and C be the driver load for a consolidation engine. Also let M be the maximum bending moment in the span. Then by well-known methods we find for a passenger engine:

One driver on span, $M = P\frac{l}{4}$ . . . . . (1)

Two drivers on span, $M = \frac{P}{2l}(l-4)^2$ . . . . . (2)

And for a consolidation engine:

Three drivers on span, $M = C(\frac{3l}{4} - 4\frac{1}{2})$ . . . . . (3)

Four drivers on span, $M = C\{\frac{(l-2\ 1\cdot4)^2}{l} - 4\frac{1}{2}\}$ . . . . . (4)

Formulas similar in form to the above were published by Mr. E. Thacher in the *Transactions* of the American Society of Civil Engineers, February, 1894.

Equate (1) and (2) . ∴ $l = 13.66$ ft.

Equate (3) and (4) . ∴ $l = 16.8$ ft.

If $l < 13.66'$ use (1) } . . . . . for a passenger engine.
If $l > 13.66'$ use (2) }

If $l < 16.8'$ use (3) } . . . . . for a consolidation engine.
If $l > 16.8'$ use (4) }

The ratio between the driver loads of the passenger and consolidation engines specified by one road is greatest in the case of Loads 17 and 48. For these loadings this ratio is 1⅓, and we find by substituting 40 for P, and 30 for C in (1) and (3), and then equating, that $l = 10.8'$ when (1) and (3) produce equal moments. By equating (2) and (3) we find that (3) gives greater moments for spans greater than 7.4′; by equating (2) and (4) we find that (4) gives greater moments for spans greater than 12.36′; and by equating (1) and (4) we find that (4) gives greater moments for spans greater than 12.77′. These results establish the fact that:

(1) gives max. moments for spans $< 10.8'$
(3) " " " " " $> 10.8'$
(4) " " " " " $< 16.8'$

Thus only *one driver* of Load 48 need be considered in finding the maxima stresses due to Loads 17 and 48. When the ratio between the driver loads is greater than 1⅓, then the passenger engine will give the maxima stresses in longer spans and more of its loads may have to be considered. If the passenger engine loading to be coupled with each of the given typical loadings in Table II have its driver loads such that the limiting length of the spans in which it produces the maximum moment be 10.8 ft. in each case, then by equating (1) and (3) and substituting 10.8 ft. for *l*, we have

$$P\frac{10.8}{4} = C(\frac{3 \times 10.8}{4} - 4\frac{1}{2}), \text{ whence } P = 1\frac{1}{3}C.$$

If then a single concentrated load 1⅓ times the driver load of the typical engine be specified with each typical loading, it will produce the same maxima stresses that would be produced by a passenger engine having equal driver loads. This single load will produce the maxima bending moments in spans less than 10.8′ long, the max. panel load for panels less than 5.4′ long, and the max. end shear in panels less than 6.75′ long. The typical engine loadings will produce maxima stresses in all greater spans.

In the presentation of this matter here given the writer has endeavored to be guided rather by present practice than by any preconceived notions of his own about what kind of loadings should be specified. The loadings specified today represent a growth of many years, and the product of the study of many minds. They have been shaped by the local conditions that exist in widely separated sections of the country. It has therefore seemed unwise to attempt to do more than endeavor to find a common ground upon which all may meet, still retaining the essential peculiarities of the present loadings, but modifying them in minor points so as to eliminate unessential differences. The typical loadings offered in this paper as substitutes for the loadings now specified are hence more numerous than those of other lists that have been proposed. A natural selection from these loadings would reduce their number, but in any case if taken as they stand, they would, if adopted, secure to a great degree the desired benefits of simplicity and uniformity. It is believed that the typical loadings in Table II, together with the single loads for spans less than 10.8 ft. long cover so completely the ground occupied by the various loadings now specified that they can be satisfactorily substituted in all cases for the specified loadings. The ratio 1⅓ of the single load to the driver load of the typical loading gives rather heavy loads for the heavier typical loadings, but as these single loads only govern the max. stresses in spans under 10.8 ft. long their application is so limited that there can be no serious objection to having them amply large. The methods of computation to be used is a question of minor importance easily settled by the individual computer, and has therefore not been considered here.

Electric Lighting from the Axle.

The illustrations show an arrangement for generating electricity for car lighting by power taken directly from an axle of the truck. This device is one of two that are now being somewhat tried and this particular one has been run some 4,000 or 5,000 miles on a private car. It will be observed that the dynamo is attached to the truck very much as a motor is attached on a trolley car, the armature being geared direct to the axle by ordinary spur gearing.

Fig. 1 shows a plan, and Fig. 2 a side view of the inner end of a passenger truck with the dynamo hung upon the axle and truck frame.

This illustration shows the truck with a special steel axle shown (Fig. 3) with a 9 inch journal turned to carry

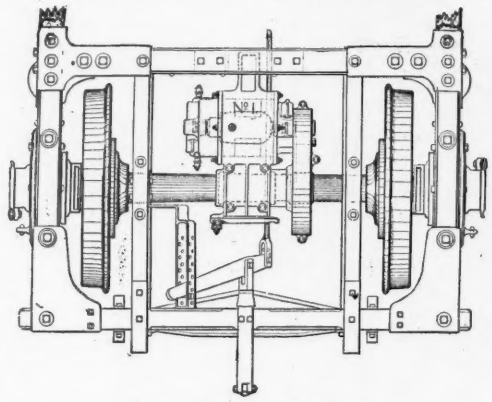


Fig. 1. Plan of Truck End.

the dynamo, and a 2½ inch collar to receive the spur wheel. One end of the dynamo is hung on the axle with babbitt bearings, while the other is suspended from the truck transome in a stirrup, which is best shown in Fig. 2. The dynamo, gearing and fittings are enclosed in a dust tight casing, partially filled with oil.

Fig. 4 shows another method of attaching the gear wheel and journal to an ordinary axle, using a sleeve

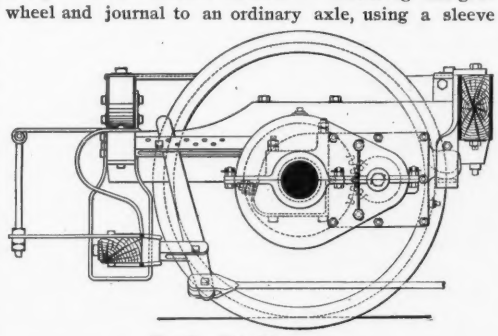


Fig. 2. Side Elevation.

clamped to the axle and fastened by friction plates forced against the axle by set screws in a collar. This device is recommended when the special axle can not be had.

The dynamo is compound wound, with the direct and shunt coils wound in opposite directions; the strength of the field being equal to the difference resulting from the two windings. This differential field is nearly constant for all speeds. In fact, it acts as a governor, and keeps the electro-motive force nearly constant. It is said that if the dynamo is wound to give 30 volts and 35 amperes

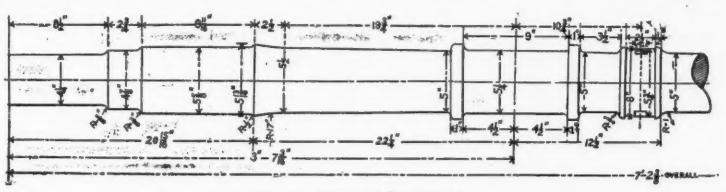


Fig 3. Special Steel Axle.

at 25 miles per hour, it will not vary 5 per cent. at 60 miles per hour. The system is automatic, the current being taken care of by an automatic cut-out and pole changer combined. The pole changer is to take care of the direction of the current when the car is run backwards, and the cut-out breaks the connection between the dynamo and storage battery when the speed is low or the train stops, *i. e.*, when the potential becomes less than a certain voltage.

A storage battery is employed to supply the car when

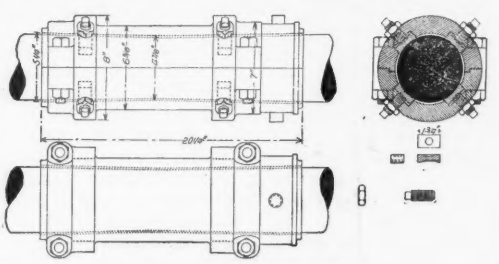


Fig. 4. Sleeve for Standard Axle.

stops are made or the car is going at a slow speed. The dynamo is not connected with it until a certain voltage has been reached (which is at 20 miles an hour), when the connection is made automatically. The dynamo, the storage battery and all their fittings are underneath the floor of the car, and the equipment, all told, including dynamo and storage batteries, weighs about 1,000 lbs.

The system contemplates the fitting of each car with a dynamo and other equipment for its own lighting plant. The storage battery is calculated to furnish light for 6 hours after the car stops, the apparatus being automatic in operation. The cost for each car is put at about $650.

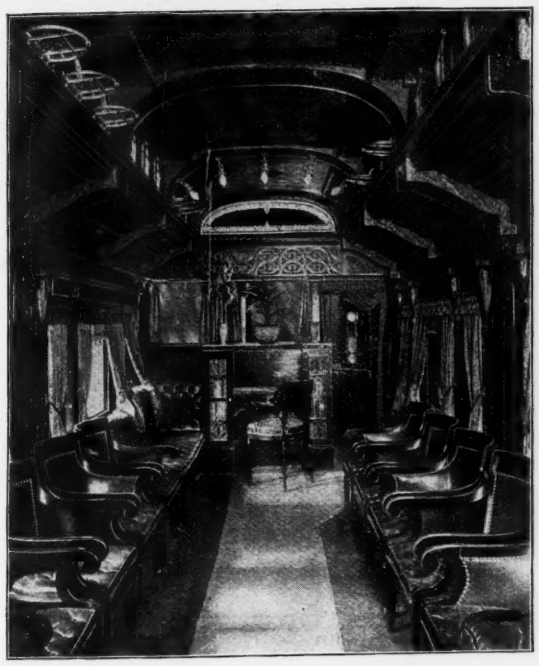


Fig. 1. Byzantine Interior of Smoking Compartment of Combination Car Marchena. Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

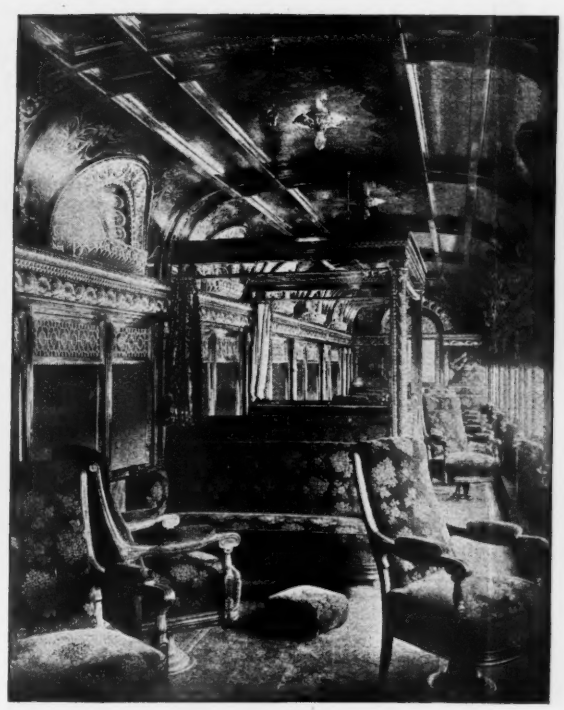


Fig. 2. Byzantine Interior of a Parlor Car. Boston & Albany Railroad. Built by Wason Manufacturing Company. 1880.

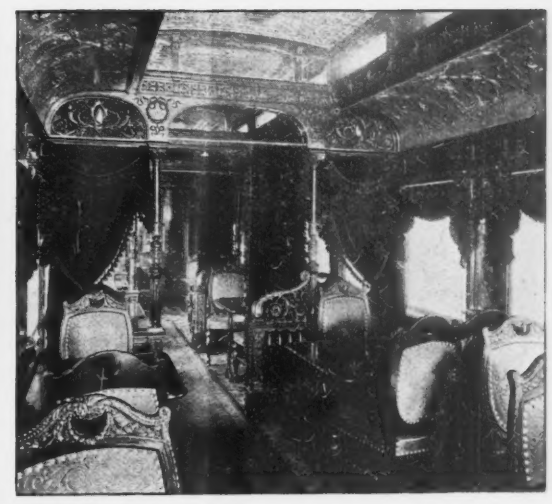


Fig. 3. Italian Renaissance Interior of Dining Car, Ferdinand. Wagner Palace Car Co.'s Exhibit at World's Fair, 1893.

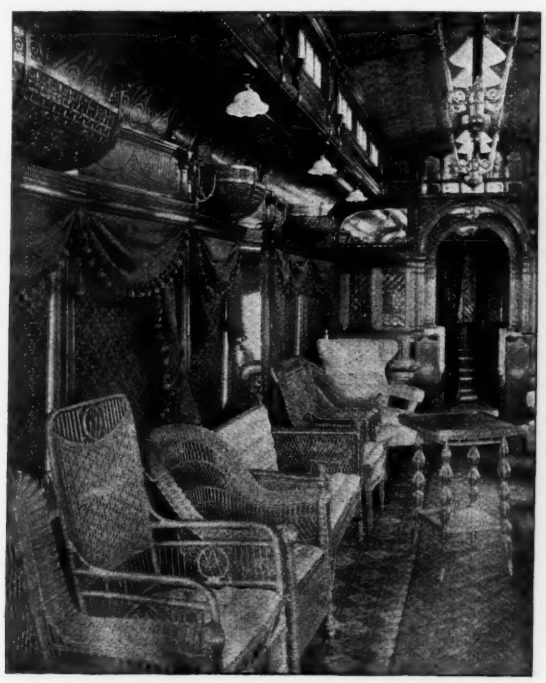


Fig. 7. Romanesque Interior of Parlor Car for Summer Service. Pennsylvania Railroad Limited Express, 1889.

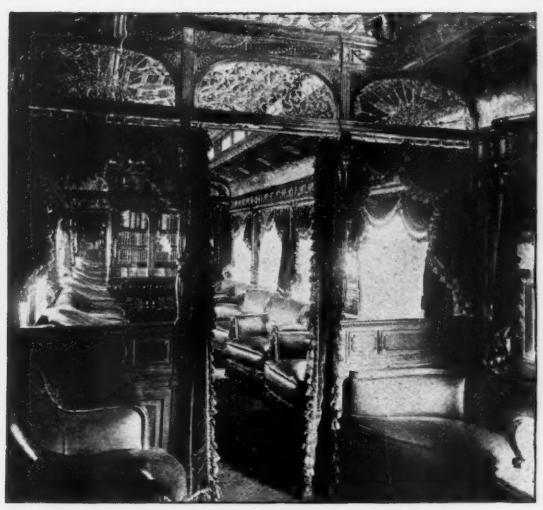


Fig. 8. Colonial Interior of Library and Smoking Compartments of Combination Car, Columbus. Wagner Palace Car Co.'s Exhibit at World's Fair, 1893.

Fig. 9. Colonial Interior of Parlor Car, Maud, for General Service. Pullman Palace Car Co., 1893.

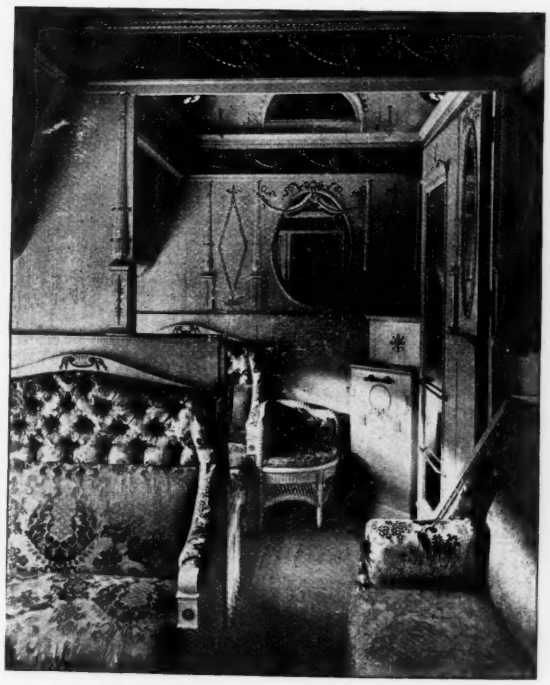


Fig. 13. Empire Interior of Drawing Room of Sleeping Car, America. Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

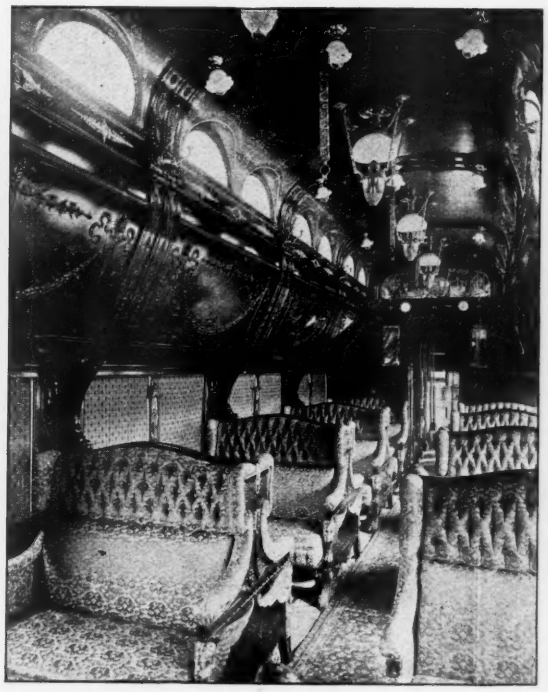


Fig. 14. Empire Interior of Sleeping Car, Gladiolus. Pennsylvania Railroad Limited Express, 1892.

Fig. 15. Empire Interior of Parlor Car, Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

lor Car. Boston & Albany Railroad. pany. 1886.

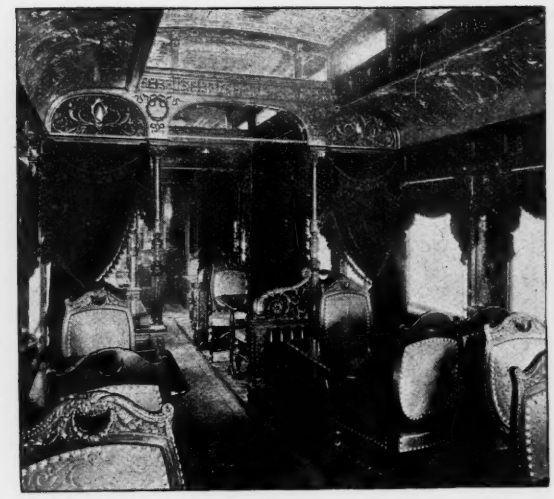
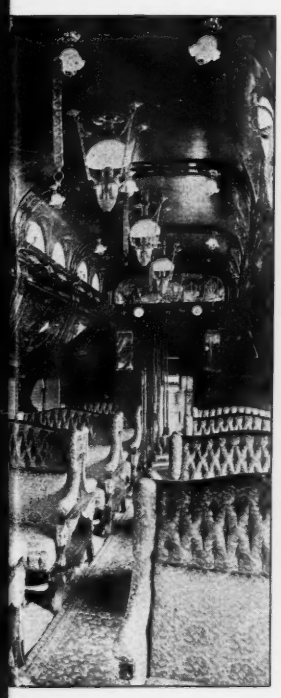


Fig. 3. Italian Renaissance Interior of Dining Car, Ferdinand. Wagner Palace Car Co.'s Exhibit at World's Fair, 1893.

und Smoking Compartments of Com- Palace Car Co.'s Exhibit at World's

Fig. 9. Colonial Interior of Parlor Car, Maud, for General Service. Pullman Palace Car Co., 1893.



Car, Gladiolus. Pennsylvania Rail-

Fig. 15. Empire Interior of Parlor Car, Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

Wagner

Fig. 4. American Renaissance Interior Dining Car, La Rabida. Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

Fig. 5. Italian Renaissance of Buffet Parlor Car, Pizon. Wagner Palace Car Co.'s Exhibit at World's Fair, 1893.

Fig. 6. Romanesque Interior of Parlor Car for Pullman Palace Car Co.' General Service, 1888.

Exhibit

Fig. 10. Tending to Colonial Interior of a First Class Passenger Car. Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

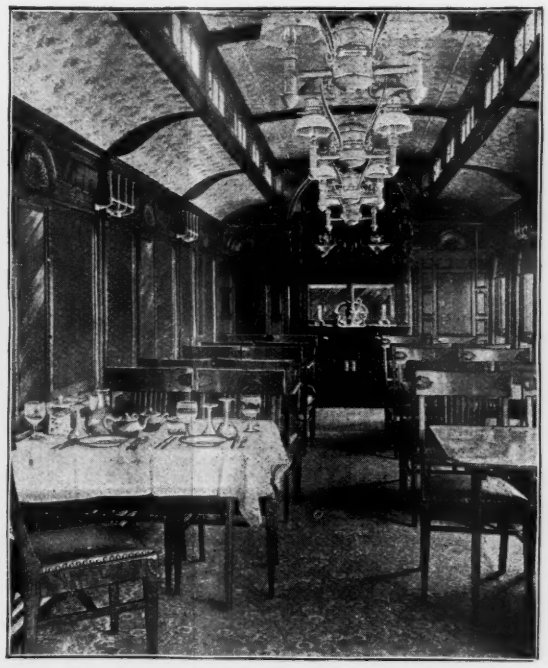


Fig. 11. Colonial Interior of Dining Car. Delaware & Hudson Canal Co. Built by Wason Manufacturing Co., 1893.

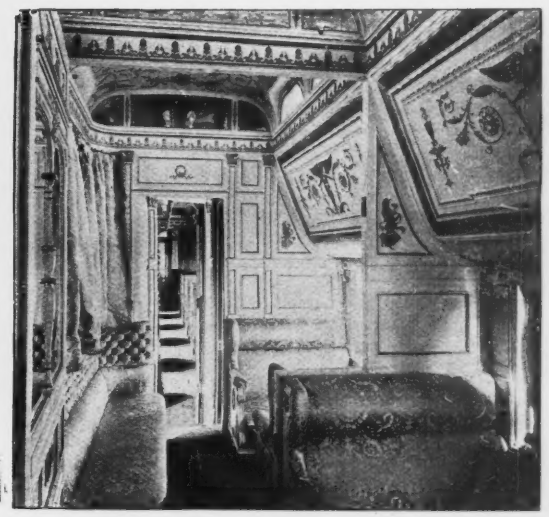


Fig. 12. Empire Interior of State Room of Sleeping Car, Isabella. Wagner Palace Car Co.'s Exhibit at World's Fair, 1893.

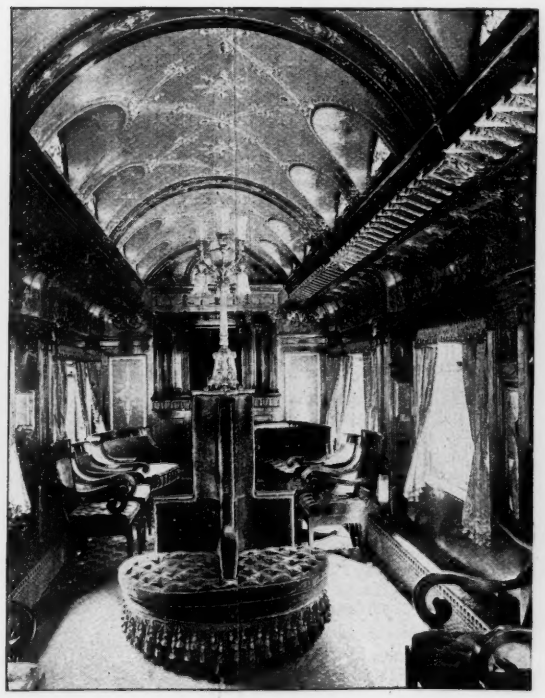


Fig. 16. Empire Interior of Observation Room of Car, Isabella. Pullman Palace Car Co.'s Exhibit at World's Fair, 1893.

Fig. 17. Romanesque Interior of Sleeping Car for General Service. Built by Barney & Smith.

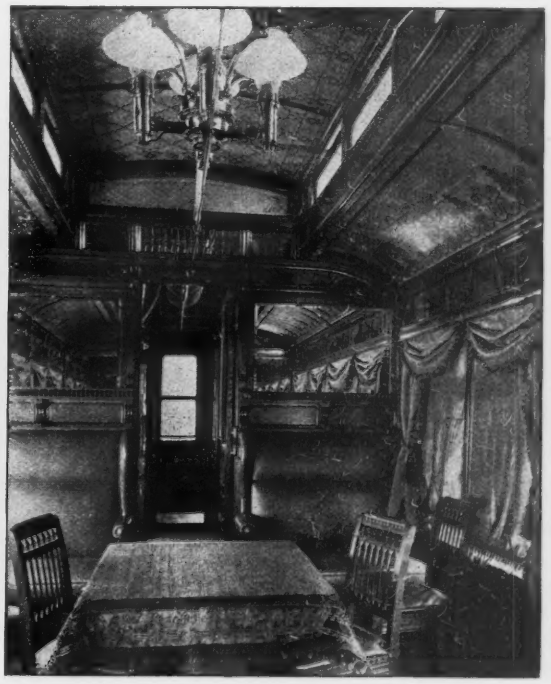


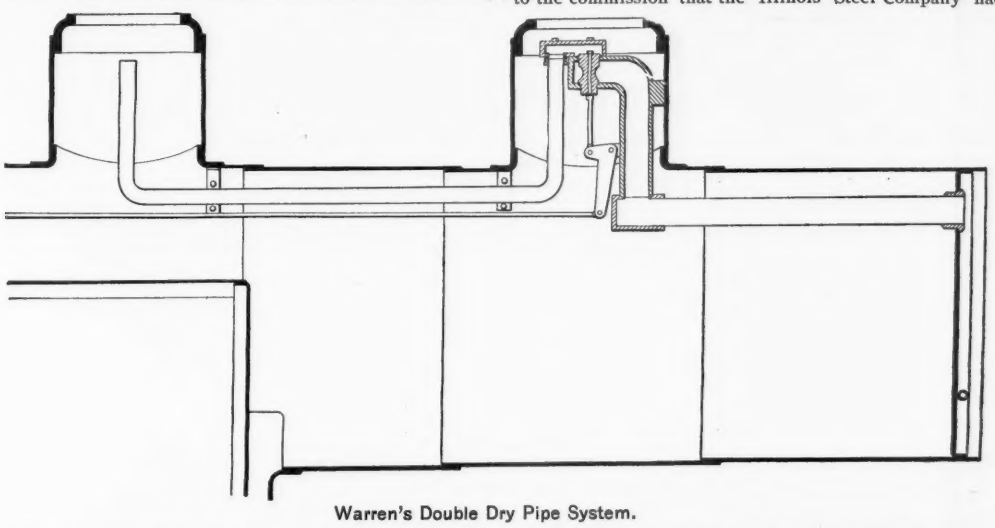
Fig. 18. Conventional American Style of Interior for Private Car. Norfolk & Western Railroad, 1890.

The system is introduced by the American Railway Electric Light Company, whose offices are in the Vanderbilt Building, New York city. The company has permission from the Pullman Palace Car Company to equip one of its cars with the system.

Warren's Double Dry Pipe System.

The accompanying illustration shows quite clearly the essential features of a dry pipe system invented by Mr. W. B. Warren, general foreman of the Toledo, Peoria & Western Railway, at Peoria, Ill., by whom a patent has been applied for. The device is intended to equalize the flow of steam in a locomotive boiler by providing two or more domes from which the steam is drawn in equal quantities when needed.

The boiler shown in our illustration is provided with two domes, the forward one containing a throttle valve of the usual construction, but with a small chamber on the top



Warren's Double Dry Pipe System.

of the valve to which steam is supplied from the rear dome through the auxiliary pipe shown. As the throttle is opened, steam enters the dry pipe from this chamber and from the forward dome itself through the lower seat of the valve.

The object of this construction is to reduce the velocity of flow of the steam after it leaves the water, thus making it less liable to carry water into the dry pipe, and also reducing the liability to foaming, and allowing sediment to settle more readily to the bottom of the boiler. It has been found that with this arrangement water can be carried at a higher level than is possible with the usual arrangement.

Several locomotives on the Toledo, Peoria & Western Railway have been equipped with this device for some time past, and have given excellent satisfaction.

Railroad Law.

The decision of the United States Supreme Court on the Texas railroad law will be found in another column; also the decision of the Supreme Court of Minnesota sustaining the law of that State which forbids the sale of railroad tickets except by authorized agents of the roads.

A press despatch states that in the United States District Court in Owensborourgh, Ky., June 4, in the case of Anderson vs. the Louisville & Nashville Railroad, Judge Barr delivered an opinion holding that the law requiring separate cars for whites and blacks is an interference with Inter-State commerce, and on that account unconstitutional and void as to all passengers.

The decision of the United States Supreme Court in the matter of Government lands granted to the Northern Pacific Railroad, which was briefly reported last week, will be found in the railroad news column of this issue.

The Kentucky law of 1890, regulating the rates of tolls to be charged for carriage and passage on two bridges over the Ohio River, at Cincinnati, which reduced the rates theretofore charged by the companies, has been declared unconstitutional by the Supreme Court of the United States, commerce over the bridge being Inter-State.

The Indiana railroad tax case briefly reported in our last issue was that of the C. C. C. & St. L., plaintiff in error, vs. the Treasurer of Marion County. The decision of the Supreme Court of Indiana, sustaining the law, was affirmed, Justice Brewer delivering the opinion. It was claimed by the company that the assessment of the company's property made by the taxing officers included that without the State, and that the valuation placed on the property within the State was based on interstate business done by the railroad, thus placing a direct burden on interstate commerce. The law provides for valuation of railroad property within the State in the same ratio to the whole value that the mileage within the State bears to the whole mileage. The court holds that this is not taxing property without the State, and is not laying a burden on interstate commerce. Three cases which involve this law were all decided together.

In the United States Circuit Court of Appeals at New Orleans, May 29, Judges Pardee, Locke and McCormick gave a decision on the long-and-short-haul law, the case being that of the Inter-State Commerce Commission versus the Cincinnati, New Orleans & Texas Pacific, the Western & Atlantic and the Georgia Pacific, appealed from the Circuit Court of the Northern District of Georgia. This case was decided by Judge Newman, at Atlanta, June 3, 1893. The New Orleans decision orders that the decree of the Circuit Court be annulled and reversed, and that the case be remanded with instructions to enter a decree in favor of the complainant, the Inter-State Commerce Commission, and against the defendants, commanding the said defendants to cease and desist from making any greater charge in the aggregate on buggies, carriages, and on other freight of the first class, carried in less than carloads, from Cincinnati to Social Circle than they charge on such freight from Cincinnati to Augusta; and in case they or any of them shall fail to obey said order, condemning the defendants to pay $100 a day for every day thereafter they shall so fail.

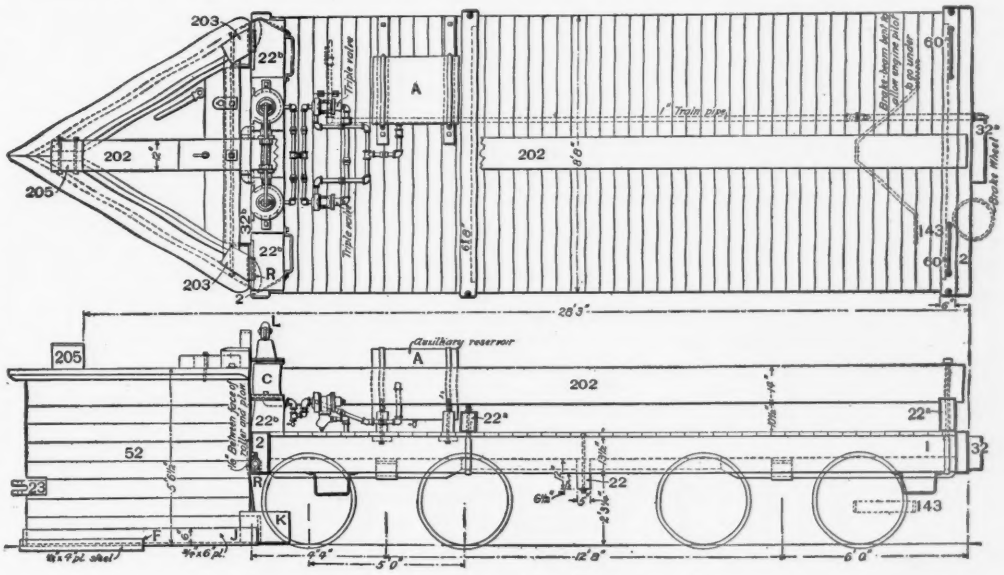
The decision of the United States Supreme Court sustaining section 12 of the Inter-State commerce law was briefly reported last week. This case originated in the complaint to the commission that the Illinois Steel Company had caused to be incorporated five railroad companies, which it operated as a device to evade the provisions of the Inter-State commerce law, obtaining special, illegal and unjust rates for the transportation of Inter-State traffic from the railroads with which the tracks of these minor corporations connected. In the inquiry which the commission instituted it called W. G. Brimson, President and Manager of the five railroads incorporated in Illinois; J. S. Kefe, Secretary and Auditor of the roads, and W. R. Sterling, First Vice-President of the Illinois Steel Company. These witnesses refused to answer questions as to the relation which the Illinois Steel Company bore to these five railroads, and also refused to produce the lists of stockholders of the several corporations. The refusal of Brimson, Kefe, and Sterling to answer, Justice Harlan stated, was based mainly upon the ground that so much of the Inter-State commerce act as empowered the commission to require the attendance and testimony of witnesses and the production of books, papers and documents, and authorizes the Circuit Court of the United States to order common carriers and other persons to appear before said commission and produce books and papers and give evidence, and to punish by process for contempt any failure to obey such order of the court, was repugnant to the constitution of the United States. The opinion, reversing Judge Gresham's decision of December, 1892, is by Justice Harlan. Chief Justice Fuller and Associate Justices Brewer and Jackson dissented. Justice Harlan discussed at length the scope and purposes of the Inter-State commerce act. The judicial power of the United States, he said, extends to all cases arising under the constitution and laws of the United States, and the Circuit Courts are capable of exercising the power in cases of that character under the restrictions prescribed by Congress. The fundamental question he held to be whether the proceeding was a "case" within the meaning of the constitution. The Circuit Court had adjudged it not to be a "case." The court below had held that if the act prescribed a penalty for refusing to testify, such proceeding would constitute a case, while a civil proceeding authorized by Congress to compel a witness to testify would not be a case of which cognizance could be taken by any court. The test of the power of Congress was not the judgment of courts that particular means were not the best that could have been employed to accomplish an end, but whether the means were unconstitutional. There could be no doubt of the power of Congress to authorize the commission to summon persons and papers relating to any matter which might be legally committed to that body for investigation. The appellees denied the right of the Government to authorize the commission to make them testify, and the power to decide the dispute must rest somewhere. It could not be that the Government was helpless in such an emergency. As the Circuit Court was competent to take jurisdiction of the parties why was not this a case for judicial cognizance by that court? It must be unless Congress was without power to enforce the statute. The constitutionality of the twelfth section was affirmed and the case was remanded for action upon the merits of the question.

Michigan Central Snow Plow and Flanger.

Our illustrations show the construction and appearance of a snow plow and track flanger recently built by the Michigan Central Railroad Co. at Detroit. This plow was designed several years ago by Mr. A. G. Dailey, Superintendent of Tracks and Bridges on that road, and has given very good satisfaction, being well adapted for use in snow of moderate depth either on main track or sidings.

As shown by the drawings, the plow attachments are so designed that they may be placed on an ordinary flat car, though the car shown was evidently designed especially for this purpose. The plow is hung upon a 12x14 in. beam (202) which is hinged at the rear end of the car. The plow is raised at crossings or switches by the engineer by means of the two vertical brake cylinders C C and other brake mechanism at the front end of the car, which are piped to the cab of the engine in the usual manner. The triple valves and other lifting mechanism are covered by suitable hoods not shown by our illustrations.

The plow itself is substantially constructed of heavy timbers, and its lower edge protected by suitable steel bars and cast iron shoes F J K. Roller bearings R are interposed between the plow and the end sill of the car against which the plow bears. The car is strongly built and is mounted upon the Michigan Central 60,000 pound, low, rigid track.



Figs. 1 and 2—Plan and Side Elevation.

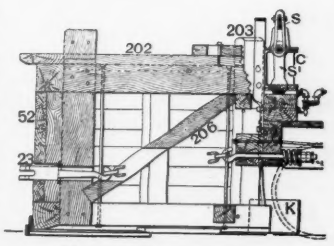


Fig. 3—Longitudinal Section.

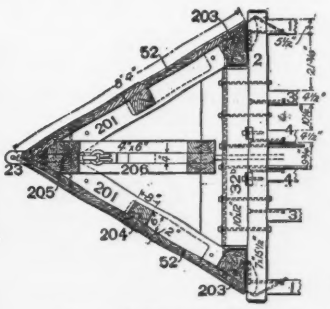


Fig. 4—Horizontal Section.

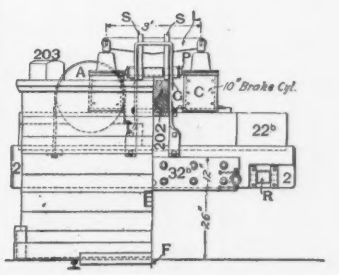


Fig. 5.—End View and Cross Section.

Snow Plow and Flanger, Michigan Central Railroad.

RAILROAD GAZETTE

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Published Every Friday.
At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENT.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

The decision of the United States Supreme Court on the Texas railroad law will be found in another column of this paper, together with references to the reports of the decision of the lower court, which we published in 1892. The present decision seems eminently reasonable. In fact, on the main questions it could hardly have been otherwise without flying in the face of the weightiest precedents. With its usual conservatism the court decides only those questions which the points at issue compel it to decide, and refrains from discussing the 5th and 14th sections of the law. The power of the State to regulate railroad rates and to delegate this work to a commission, is upheld, in accordance with well-known former decisions, but the rates which the present Texas Railroad Commission made and which the railroad bondholders complained of, are declared to be too low. The Commission can now go ahead and make new tariffs; and, if it choose to be so obstinate, it can make new rates only a trifle higher than those which it made before, and thus make endless trouble under forms of law. But, though Justice Brewer takes such care not to discuss section 5, he declares in plain language that in case unreasonable rates are again made, Judge McCormick may again restrain their enforcement as summarily as he did before. Both sides profess to be satisfied with the decision, and if both intend to pursue a reasonable course they have good cause for such feeling. The railroads have the assurance that the courts will be prompt to do them justice (and, by reading between the lines, one can see that Justice Brewer is glad that railroads always have friends in two or more States, so that they can always bring their grievances before a disinterested court). The State will continue to have the power to stop all extortion, and certainly has ample force of public sentiment to back up any reasonable action the Commissioners may take in this direction. As before, however, the Commissioners can annoy the railroads to their hearts' content, and if the railroad question continues to be prominent in Texas politics no one can predict with any confidence what the Commission will do.

The main question which every one would like to have seen decided is left just as it was before. Every citizen of Texas who feels aggrieved at anything the railroads have done, and every "granger" everywhere, was hoping to get an opinion showing how the owners of watered stock could be prevented from making rates high enough to earn liberal dividends on such stock; and all students of railroad questions would be glad to see the ethics of that question boldly discussed by a wise, practical and authoritative body like the Supreme Court; but the gratification of this wish must be still further postponed. There seem to be facts in plenty going to show that money was very unwisely spent on the International & Great Northern—not to say wasted; and it might be easy to show that if the road earned enough to pay a fair interest on its bonds and a fair dividend on its stock, at their par values, it would be paying more than a reasonable income on the money actually invested and fairly spent; but in point of fact the earnings fell so very far short of doing this that the stock and bonds, even if shrunk to the figures demanded by the most violent enemy of the road, would still have had to go without their desired income. The decision states that the present bonds and stock represent value received; but it goes no farther; it does not say whether the present owners paid more than what the road was worth or not. It is stated in a general way that the road had cost $50,000 a mile * and that it could not be duplicated for less than $30,000 a mile. But the earnings would not pay a fair income on $30,000, or even on $20,000; so that, however strong may have been the desire of the managers of the road to swindle the people of Texas, they were unable to carry out their design and therefore the court cannot recommend any punishment. The question of jurisdiction, which takes up a large share of the Court's attention, seems to have been settled on reasonable lines. Justice Brewer hints that the State of Texas fully intended to waive its rights in this case. Whether or not he is justified in this, we cannot say, but the railroad act certainly was framed by very ingenious lawyers. This being so, we do not know exactly what construction to put upon Justice Brewer's assumption that a legislature or a railroad commission "would not deliberately reduce rates to an unremunerative basis." As far as the letter goes this may be true, but if we may judge by the spirit we may fairly conclude not only that the people of Texas intended to "squeeze" the railroads but that they took pride in avowing that purpose.

The Texas decision is not the only one lately rendered that is of interest to railroad men; we record a half dozen others in this issue. That sustaining the Minnesota anti-scalper law is of more than passing interest for the reason that the law in that State does not contain that mischievous provision exempting bona fide travelers, which weakens the anti-scalper laws of Illinois and Indiana. The Minnesota decision seems to us exceptionally clear and strong. While the law of that State practically affects only two cities, the decision will be valuable in other States as a precedent. The main question, however, will be the same in the future as in the past, and that hinges on the attitude of the railroads toward the ticket brokers. As long as scalping is favored by even a few traffic managers the nuisance will not be greatly abated. The reversal of Judge Gresham's decision refusing to summon witnesses for the Interstate Commerce Commission, was what was to have been expected. "The courts will not play second fiddle to a nondescript body like the Interstate Commerce Commission" was the pith of that decision, as paraphrased by the reporters at the time, and they seem to have quite accurately reflected the general opinion—that as an exhibition of spirit it was admirable, but as law it was weak. While the Supreme Court discusses technicalities at considerable length, and splits on some of these, the main point seems to be clear, that the power of the Interstate Commission to make inquiries is constitutional and that Congress has taken suitable means to enable such inquiries to be carried out. The Kentucky "Jim Crow car" decision is inexplicable until a fuller report shall be published. In sustaining the Mississippi law on the same subject, the Supreme Court of the United States hedged by saying "the Supreme Court of the State, having construed the law as applying solely to commerce within the State;" but that, we think, was only a sample of the proper conservatism of that body, and we should rather expect it to sustain a law of this kind without that qualification if the question were squarely presented to it. A common sense view would class it as a police regulation and therefore within the powers of the several States regardless of the Interstate Commerce law. The reversal of Judge Newman's decision on the long-and-short-haul clause (which was weak in many points) seems to establish the law that the Georgia Railroad cannot participate in a through rate from Cincinnati to Augusta unless it also establishes through rates, at least as low, from Cincinnati and all points south of it on the same line, to all points on its own line between Augusta and Atlanta. This is the principle to which the great bulk of the joint freight tariffs of the country were made to conform in 1887, but there are probably many instances where freight that is rebilled to local stations is carried in violation of it.

The Metropolitan Railroads of New York and London.

Last week we considered the frequency of stations and the frequency and speed of trains on the two systems of rapid transit now under consideration. A further example of the difference in train accommodation in the two cities is given by the train-mileage. On the New York system in 1892 the total passenger train-miles were 9,106,870, which is equal to 345 trains each way every day over the whole system. In London in the same year the passenger train-miles were 3,702,120, equal to 56 trains each way every day over the whole length of the lines.

An absolute comparison of the fares paid by the passengers on the two systems is impossible, for the distance traveled is not given in either country; nor can we give the average fare paid per journey by the passengers on the London system, because we do not know how many journeys were made by the holders of season tickets. In New York each passenger pays 5 cents whatever distance he goes and there are no return tickets. In London the rates are graduated, pretty roughly, according to the distance traveled, and return tickets are sold. In the table below are given the fares in cents per mile on the underground in London and on the elevated railroads of New York for the same distance.

	London.			New York.
Distance, miles.	1st class.	2d class.	3d class.	One class.
1.31	5.30	3.80	2.30	3.81
2.66	4.51	3.01	2.25	1.88
4.46	3.14	2.02	1.57	1.12
7.80	3.08	2.30	1.54	0.64
10.70	3.36	2.43	1.87	0.47
11.20	3.04	2.32	1.80	0.45

It will be observed that somewhere between 1⅓ miles and 2⅔ the rate in New York becomes cheaper than the single trip, third class in London, but return tickets are sold to and from all the stations on the London lines, and many journeys are made at round trip rates, which reduces the average fare paid. The rates per mile by these return tickets are about 25 per cent. less than the single trip rates for first and second classes, and about 20 per cent. less for third class. This is only a rough statement, however, for these reductions vary all the way from 16 to 30 per cent. But even the third-class, return trip rate is higher than the New York rate, if one is going, say, three miles or more.

The receipts from holders of season tickets were only about 10 per cent. of the total receipts. So, neglecting the receipts from this traffic entirely, we can get at a reasonable estimate of the average fare collected from each passenger on the London roads, which we find to be 4.16 cents. The receipts from first and second class passengers are about 45 per cent. as much as the receipts from the third class, again excluding season ticket holders. No third class season tickets are sold, but workmen's tickets, good on a few trains, are sold at low rates. The average fare per journey might or might not be increased if we included the season tickets, but probably it would be raised, for these are all first and second class, and the journeys are probably longer than the average. It would be very little affected by the workman's tickets, for the receipts from this traffic are but one-half of one per cent. of the total passenger receipts, and the journeys are doubtless longer than the average. Therefore it is safe to conclude that the average fare paid per journey is about the same in the two cities. If this is true, the average *rate per mile* paid on the London underground is higher than on the New York elevated. The reader can figure this out for himself by the aid of the little table above.

The element of comfort remains to be considered. In this, as in frequency of trains and of stations, the advantage is greatly on the side of the railroads of New York. The first class carriage on the London underground is very much more comfortable than any car on the elevated of New York, but the proportion of travelers who go first class is very small; in fact (leaving out the season ticket holders again) it is only five per cent. So, in considering the accommodation offered to the great public, we must compare the second class carriage, and, what is far more important, the third class carriage, with our own. The second class carriage is fairly comfortable. The seats are upholstered and cushioned and reasonably clean, but the car is absolutely without any attempt to make it attractive. In freshness and brightness it is distinctly below the average car on the New York elevated. The third class carriage on the underground is much inferior to anything that we know of in the United States. The seats are bare of all upholstery; the backs are vertical and the seats are narrow, and it is a penance to sit upon them. The so-called cattle cars in which the Illinois Central carried people to and from the World's Fair were quite as comfortable as these, and had the advantage of being fresher as they were open to the breezes. The interior finish is of soft wood, painted. These carriages convey over 80 per cent. of the passengers on the underground, still neglecting season ticket travel.

All of the carriages of the underground are low, the roofs being made without a clear story, and are dimly lighted. The lighting of the elevated cars of New York, to be sure, is nothing to brag about, but there is this important difference, that a great part of the movement on the elevated railroads is done in daylight,

*Probably this is a misprint; the annual statements of the company in Poor's Manual and the Government reports show "cost of road" less than $30,000,000 (825 miles).

while the carriages of the underground must be artificially lighted at all hours. The insufficiency of the lighting there has recently developed a novel idea in the way of an electric reading lamp. This is an incandescent lamp put a little above the head of the passenger, the current being supplied by storage batteries. The passenger may drop a penny in a slot and get a good light to read by for half an hour. These lamps have been quite extensively put in by the Metropolitan District and are certainly a great convenience, but naturally the public feels that it ought not to be taxed extra for sufficient light to read by. The question of heating the carriages need not enter, for artificial heat is seldom needed on trains running underground in the mild climate of England.

In general attractiveness the elevated railroad is entirely out of comparison with the underground. Nobody but a crank could deny that it is much more cheerful and interesting to ride in the open air and sunlight where you can look out and get a glimpse of the life around you than to ride shut up in a tunnel; and while the approaches to the elevated railroad stations and the surroundings of those stations are devoid of anything to please the taste, those of the underground are not only dirty and unadorned, but are actually gloomy.

This series of articles will be finished in a fourth, to be published next week.

Friction of Connections and Brake Shoe Pressure.

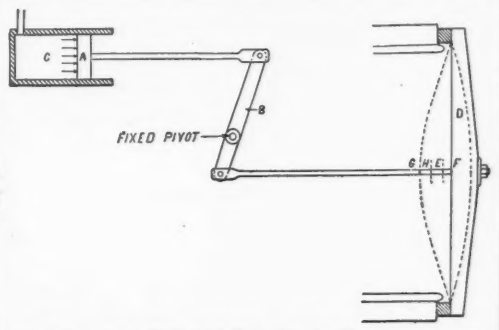
In a recent paper before the Western Railway Club there were some diagrams showing the friction of the piston packing and foundation brake gear of car brakes. The total friction due to these parts was found to be about 20 per cent. This was called a "loss between the beam and the air cylinder." Our purpose is now to show that this is not really a loss that gives any deficiency in brake power in the practical operation of trains, and further, to show that this friction acts as a "lag" and may cause either an increase or a decrease in the pressure of the brake shoes on the wheels.

It was explained in our issue of June 1 that there is sufficient braking power with the standard brake beam pressure of 70 per cent. of the weight of empty cars to answer all practical purposes of railroad operation except in cases of emergency. In fact 70 per cent. of the light weight of the car is as much brake beam pressure as can be used without increasing the liability of slid wheels. In an emergency the brakes are applied with a "quick action" and the pressure in the brake cylinder is about 58 pounds per square inch, but at other times, during ordinary operation, not more than 50 pounds is reached unless the engineer is carrying more than the standard 70 pounds pressure in the train pipe. There is more than enough braking power to offset the friction of the mechanism in ordinary work with service application of the brake, and in emergency application the Master Car Builders' Association standard gives a pressure to the brake beams equal to 70 per cent. of the light weight of the cars, and this, as has been said before, is as high as it has been found in practice can be used without increasing the liability of slid wheels. With this, under loaded cars, there is no danger of sliding the wheels unless the engineers carry too much train pipe pressure; it is only with light cars that the wheels are liable to slide.

A means has long been sought to vary the leverage of the brake gear so that the pressure would be greater for loaded cars, but so far nothing has been brought out that has been simple enough for practical use As explained in the *Railroad Gazette*, page 373, the new "high speed" brake has been devised to increase the brake beam pressure when the brakes are first applied to the wheels, that being the time when the friction between the shoes and the wheels is least. This brake is intended to leak off and then reduce the brake beam pressure as the speed decreases in order to prevent sliding the wheels.

To show how the friction of brake apparatus may act as a "lag" and in some cases reduce the friction and in others increase it, the accompanying diagram has been prepared. *A* is a piston, which moves in and out of the air cylinder. The friction of this piston is 10 per cent. The lever *B* represents in a simple way the foundation gear used under cars. The friction of the joints of such gear amounts to about 10 per cent., making a total of 20 per cent. When the brakes are applied with a comparatively slow increase of pressure, as in the case of service application, the parts move slowly and the pressure on the break beams is reduced about 20 per cent. by the friction of the piston *A* and the parts *B*. The normal pressure on the piston might pull on *D* so hard as to deflect it to the point *E*, yet the reduction due to the friction of parts in service application we will assume only leaves a residuum of pressure sufficient to deflect the beam as shown in the full line at point *F*. In this way it is clear that in service application the friction of the parts reduces the pressure before it reaches the brake beam, but not enough to cause any practical loss, for the friction is overcome by the excess of air pressure that is always available for service work.

In emergency, or quick action application the case is quite different. The air is admitted to the cylinder *C* with great velocity, and the increase of pressure is so quickly made that the piston *A*, the foundation gear *B* and the brake beams move with great rapidity, and there is considerable momentum, enough to deflect the brake considerably more than that due to a quiet application of the pressure. In other words, the action is like putting a load suddenly upon a spring, which, it is well known, will cause about double the deflection of a load slowly applied. For the purpose of illustration it may be assumed that the brake beam is deflected to the point *G*, where the pressure on the wheels and the deflection of the beam is much greater than it will be immediately after the beam has recoiled. The recoil occurs just as with a spring that is loaded suddenly. In this way an oscillation is set up in the brake beam and the friction acts to retard the oscillations in the same manner as with the Gibbs spring



controller (see *Railroad Gazette*, April 27, page 300), and also in exactly the same way as the friction between the plates of a plate spring acts to retard the motion of such springs. A plate driving spring for a locomotive will exert considerably less pressure for a given deflection when the load is being taken off than while the load is being applied; this is called the lag of the spring, and is the kind of lag that exists in brake gear where there is a friction among parts.

The lag of the brake gear acts to retard the motion and to hold the apparatus in any position where it may be. Thus when the beam has deflected to *G*, the friction tends to hold it there and retard the return. But if the recoil is very great the beam may return past the point *H*, which has been taken as the position of the beam if there was no friction and the emergency pressure had been slowly applied. Now, it may occur that the recoil will bring the brake beam back again past *H* and there may be several oscillations and finally the friction may hold the beam on either side of *H*. If toward *G* then the final pressure will be greater than if the brake had been slowly applied, and the lag due to the friction will cause the brakes to be applied with greater force than if there was no lag. Likewise it is true if the oscillation ceases when the beam is on the other side of the point *H* then the resultant pressure will be less than if the brakes had been applied slowly. In this way it can be seen that the lag may increase or decrease the final brake beam pressure in the case of an emergency application, and that the increase may be as much as the friction of the parts, or 20 per cent. That is, the friction may cause either increase or decrease in the brake beam pressure when the brakes are suddenly applied, especially where the parts are heavy, as the greater weight increases the momentum.

This matter of lag due to friction of brake apparatus has a definite bearing on the high speed brake. When the high speed brake is applied, the pressure is high, and is thereafter reduced so as to prevent sliding the wheels. The reduction is comparatively slow, and the friction acts to retard the reduction, and when the reduction has ceased, the final pressure may be considerably higher than that which would be given by the reduced pressure in the brake cylinder if there was no friction. Let us take an actual case. Supposing the initial pressure in a brake cylinder of a high speed brake to be 100 pounds, while the final pressure after reduction is 58 pounds. Taking the friction at 20 per cent., the holding power of the friction, or lag, would be equivalent to 11.6 pounds. This would make the final pressure on the brake beam the same as if the pressure in the brake cylinder was 69.6 pounds without friction in the apparatus. Of course this does not in any way impair the efficiency of the high speed brake, but is one of the conditions that must be considered in designing such a brake, and misusing it, to prevent getting an excess of final pressure such as will slide the wheels. The only practical effect of this lag is in emergency work, when the quick action brake is used and it does no harm. Experience has taught what pressure to carry and what leverage to use, and practice and experience will finally show what pressure to carry with the high speed brake, and in this way the lag will not become an important factor and in no case will it represent an actual practical loss of braking power.

Tne Supplymen and the Associations.

A gentleman whose good opinion we value highly writes to us that a certain dealer in railroad supplies is not going to the Saratoga conventions because of something that has been said in the *Railroad Gazette*. Other friends have said to us, "What is the *Railroad Gazette* up to in discouraging the attendance of supplymen at the conventions?" A diligent search of our files for the last year discovers the following words on page 259 of our issue of April 13, 1894: "The supplyman feature ought to be eliminated from the conventions." These words occur in a quotation which we made from a letter written by a General Manager concerning the consolidation of the two associations, and they are the General Manager's language and should not be attributed to us. In fact, it is highly probable that the General Manager himself did not intend to make any such sweeping and unqualified statement as these few words indicate. If he had taken the time to develop his idea it would be plain that he has no objection whatever to the annual displays of material of all sorts which form so valuable a feature of the conventions. No reasonable man could object to these, unless it may be the men who are put to the expense of sending them.

The ten words quoted here are, so far as we can find, positively the only words that we have printed on this delicate subject within the last year, and it will be seen that they are not ours. A little less than a year ago, however, namely, June 23, 1893, page 460, we did print a short editorial on the matter of the great expenditure made year by year by the supplymen for the entertainment of the members of the associations, and we should have reprinted those words week by week ever since if we had thought that the subject was important enough to warrant such a use of our space.

The candid reader will see, if he takes the trouble to look back at that editorial, that we simply called attention to and endorsed the official action of the Master Car-Builders' Association at the Ninth Annual Convention (1875), which was confirmed by printing the resolutions then passed, year by year, in the annual editions of the Report of Proceedings, and emphasized at Lakewood last year by the simple and dignified letter of the Executive Committee to the Chairman of the Supplymen's Committee on Entertainments. The preamble and resolution of which we speak set forth that the practice of entertaining the members of this Association has become an established custom and has assumed somewhat the character of an obligation; the expenditure of time and money has been very much greater than the members of the Association have a right to expect; the expense of such hospitality has been interpreted as having a significance which has been the cause of embarrassment to members, and therefore the Association thanks its friends for liberality in the past and requests that in the future there be no more expenditure of money for the public entertainment of members of the Association. Last year the Executive Committee, in calling the attention of the Supplymen's Committee to this action of the Association, did so because at each successive convention an increased expenditure has been noticeable.

There is nothing very obscure or complicated in our reasons for sometimes calling attention to this dignified official action of the Master Car-Builder's Association; we have simply wished to remind members of the Association, railroad officers in general, and dealers in railroad materials, that the Association dis approves officially of the lavish expenditure which is made year by year for entertainment at the conventions, and to remind members of the Association that they cannot go on accepting this sort of hospitality without suffering in dignity before the world and in their own self respect, and to remind the supplymen themselves that this costly custom is not only unnecessary, but is disapproved of by very many of the best members of the associations.

Hospitality is one of the obligations and pleasures of humanity, and is common to all states of society so far as we know, but there are many foolish things done under its sacred name. For men who sell goods to entertain men who buy goods is no better or worse than for men who write in the newspapers to entertain

men who read newspapers, but we suggest that the idea that in order to sell goods to a man it is necessary to spend money on him is a barbarism that is fast passing away. Unfortunately, there is a large class of salesmen who love to spend the money of "the house" for their personal enjoyment, and who love to grease the wheels of commerce in this way; but these men are gradually getting found out and their usefulness in trade is year by year declining. We would suggest that men of this class do not correctly interpret the ideas and manners of the majority of buyers and sellers as they go back and forth between them.

This year of hard times would be a good year to begin a reform in what has grown to be a foolish and wasteful practice. We are often told that the great use of the period of adversity through which we are passing will be in its lessons of economy. Why, then, should not the supplymen begin a reasonable economy in their expenditures for entertainment at the conventions, and let one assessment answer for both conventions?

The Discussion at the American Railway Association.

The report of the proceedings of the last meeting of the American Railway Association is out, and it will prove exceedingly interesting reading to every one interested in signals or train rules who was not present. It is so solid—the information contained in the discussions is so full and so valuable—that it is out of the question to reproduce it or even give a fair idea of it in the space at our command. The discussion on the report of the Joint Committee occupies 29 pages, and while its value as an essay on signaling is somewhat detracted from by the usual imperfections of extemporaneous discussion, it is well worth reading, especially to one acquainted with the principal speakers. In speaking of this meeting on April 20, we said that postponement of action on the signal rules was the only right course for the convention to take. The full report only confirms this view.

The discussion on distant signals—what they are for, and where they should be located—was especially valuable, and that on colors for night signals was equally good. In the course of the latter, letters were read from Major Marindin and others, from which it appears that the inspecting officers of the British Board of Trade have long advocated the adoption of green lights for all clear. Major Marindin says there is no fixed caution signal in England. It is true that English distant signals at night are just like a home signal, and the rules require trains to stop *at* the distant signals; but as, in fact, they are universally used as caution signals, why not call them so?

Although the Committee took back its recommendation of green for all clear and violet for caution, there was good evidence given at the meeting that violet had been used with considerable success on the New York, New Haven & Hartford. The change in the report of the Committee was justified, however, for it is not desirable to take action on such an important question until the subject has been more fully discussed. The final postponement of the question was ordered, however, after a statement that examinations for color-blindness, "even when conducted after the most approved manner," are unreliable, and that the percentage of color-blind men in the railroad service [on roads examining by the most approved methods?] is much larger than is generally supposed. Doctors Thomson and Jeffries would probably challenge this assertion very sharply.

The discussion of the relative merits of automatic and non-automatic block signals was one of the most profitable, but yet it did not bring out the most essential point, which is that emphasized in the letter of Mr. Blodgett to the *Railroad Gazette* printed on April 20. The principal feature of this discussion was the contention that there should be a man at each signal, not simply to operate the signal, but to see that enginemen obey it. Representatives of the Illinois Central held that this was not necessary, their experience with the Hall signals convincing them that "it is not necessary to have a man on a watch tower in order to know definitely whether the signal at a certain time indicated one thing or another."

The discussion on the uniform code, which took up nearly the whole of the first day, was only less interesting than that on signals. The Committee had recommended changes in rules 4, 11, 13, 17, 20, 29, 31, 38, 67, 70, 74, 79, 90, 92, 95, 105, 108, 110 and 521, Rules 96 and 97 were cut out and No. 99 modified so as to cover all three; slight changes were also proposed in train order forms B, C, D, E and H, and one of the forms under G was omitted. Nearly or quite all of these changes were excellent improvements, and all but rules 20 and 99 were substantially agreed to, after considerable discussion; but a motion to recommit the whole code was then made, and, considerable discussion having arisen as to whether the code should consist of precise rules or of definitions of general principles, recommitment was ordered. Besides the changes just noted the Committee had also discussed changes in rules 509, 510 and 513 so as to make a train order a holding order before it has been repeated, but this recommendation was withdrawn by the Committee. If the Train Rule Committee shall hereafter be governed by the prevailing sentiment in this discussion, we may see radical changes in the form of the standard code, for if the code is to lay down principles only, instead of doing this and also prescribing phraseology, its character will be changed from that with which we are now familiar to something like that of the recommendations for block signal systems in the Joint Committee's report of March 12 (printed on pages 101, 102 and 103 of the present pamphlet). However this may come out, the fact should not be lost sight of that the formulation of correctly phrased rules was one of the great features of the work of the Train Rule Committee of seven years ago.

The report of the Committee on Safety Appliances which was presented at the meeting, showed 303,761 freight cars equipped with automatic couplers, and 239,892 equipped with air brakes. The first named number includes an estimated number of cars not owned by railroad companies. Taking railroad companies' cars alone, 28 per cent. of those reported had automatic couplers and 23 per cent. had air brakes. Of the locomotives reported, 16 per cent. had no power brakes.

Examination of Locomotive Engineers and Firemen.

Probably the best way to educate men for locomotive engineers and firemen is similar to the means adopted in educating men for other callings; that is, to give practical experience and at the same time a certain amount of book learning. A man starting with the intention of becoming a good fireman, and finally a good engineer, will provide himself with a certain amount of literature; he will get his experience for a fireman in serving for a longer or shorter time, depending on circumstances, as forward brakeman, wiper, or working with another fireman for a few trips; and his experience for engineer he will obtain while serving as a fireman. Whether a man is physically able or sufficiently careful and cleanly to either fire a locomotive or to have charge of one, may be judged from his every day work, but to judge of his knowledge of subjects with which engine men should be more or less acquainted, an examination seems necessary. Railroad companies are gradually requiring of their firemen and engineers, the latter especially, a more thorough training, and it is very possible that before many years laws will be enacted requiring, as is now required of stationary engineers, that locomotive engineers shall take out a license.

That locomotive engineers and firemen should have a certain amount of general information about combustion, lubricants, friction, steam, air-brakes and other allied subjects, there is no question; there is, however, great divergence of opinion as to how those responsible for the satisfactory handling of the engines shall satisfy themselves that a man is fitted for the position of fireman or engineer. But there is a practice in force on some railroads to which there seem to be decided objections.

The practice is that of providing a fireman or engineer with a set of questions which will be asked in examination at a stated time, usually a year from the time the questions are given. It is well known that engine men are gregarious, (like all healthy minded men), that they congregate at round houses and other places to compare notes, and that it is hard to get from a number of them more than the one common opinion about any new device that may be introduced. When questions are provided a year, or even a day, in advance of the examination, the same process by which the men arrive at the same opinion concerning a new device will lead them to formulate a stereotyped set of answers to the examining questions, and the answers will be sung at the examination with or without thought or understanding. Under these conditions the examiner can get little idea as to whether the man being examined understands the subject, or the meaning of the answers he is making.

With a man of sufficient intelligence to become a desirable engine runner, the best plan must be to provide him with suitable literature, if he cannot provide it himself, and give him an idea of how thoroughly he is expected to understand each subject; then an examination in which the questions are varied as much as possible and never known in advance, might give some indication of the man's understanding of the subjects treated. Asking the questions sometime in advance of the time the answers are to be given is in itself objectionable, and much more so is the tendency to ask questions of such a nature and in such a way that the answers must be a sort of vindication of the policy of those who prepare the questions. To illustrate this: If it is asked: "What are the objections to crown bar stays?" and "What are the advantages of screw stays?" and the advantages of crown bar stays and the disadvantages of screw stays are not asked for, it is easily seen that those who prepared the questions favored screw stays. But to ask the questions in this way is an injustice to the men, because during the time they are preparing for the examinations they are looking for the advantages of one and the disadvantages of the other, and the result is that their opinion of various methods of staying, as it appears in their answers, is not one they have formed themselves, but the one that is forced upon them. A long list of questions similar to this example might be quoted, but this is sufficient to illustrate the point it is desired to make. If the examining questions are to be asked in advance of the time set for the examination, they should be arranged carefully, and in such a manner as to compel a study of both sides of each question, and especially of those questions on which even the "experts" split.

The coal strike remains about the same. This is a very brief summary to give of an industrial disturbance which very seriously affects the whole of the Northern and Central States, but it is about the only one possible in these columns, as the reports of the past week have consisted almost wholly of accounts of lawlessness by strikers at scores of places which are all the same except in local details. There have been a few attempts to work the mines with non-union men, but with little success. The militia has been called out to maintain order at several places in Illinois and Indiana, and on Tuesday of this week the Governor of Maryland called out two regiments to keep the peace in the Cumberland region. Reports from Terre Haute, Ind., and vicinity, tell of all sorts of lawlessness designed to prevent new miners from working and the railroads from carrying coal. At one place a freight train was stopped and five cars of coal were set afire and burned up. Dynamite has been used to destroy railroad track and in some cases trains have had narrow escapes. It is said that four bombs were placed under a train load of soldiers at Farmersburg, Ind. The railroads which carry West Virginia coal to Lake Erie, are constantly threatened, and the Cleveland, Lorain & Wheeling had two bridges burned last Wednesday morning. A trestle of the Chesapeake & Ohio was burned at Sewell, W. Va. A bridge on the Elgin, Joliet & Eastern, near Carbon, Ill., was burned. The roads were obliged to station guards at all bridges, and an important bridge of the Norfolk & Western over the Ohio River at Kenova was guarded by sheriffs. There has been some little resumption of mining in Pennsylvania, and there are reports of considerable bodies of negro miners being brought from Alabama to work in Pennsylvania mines. At Cripple Creek, Col., where the miners practically had their own way, the trouble is said to have been settled on June 5, but the reports are not very definite. The conference between miners and operators at Springfield, Ill., last week amounted to nothing.

A disastrous and widespread flood has prevailed in British Columbia since May 23, and up to June 6 was still rising. The valley of the Frazer river was inundated for 100 miles, and Vancouver, Victoria and Nanaimo are reported to be the only important towns in the province not affected by the flood. Telegraph wires were down and the damage to railroads, which must be very great, has not yet been reported with any accuracy. The Canadian Pacific Railroad put on regular steamboats to transfer its passengers over the flooded district. The government had to send out steamers and small boats to relieve distress, and there was a beef famine. There were also serious floods in Washington and Oregon, and the Northern Pacific was flooded for many miles in Montana and Idaho. In Portland, Or., on Monday last, a large part of the business district was submerged, and at the Union passenger station water was two feet deep. The Union Pacific shops were flooded and that road ran no trains into the city. The damage to the Union Pacific between Portland and Umatilla will, it is thought, reach hundreds of thousands of dollars. There was a great flood at Pueblo, Col., on May 30, and another one on June 5. One report stated that over two miles of the Denver & Rio Grande tracks were swept away. The Atchison, Topeka & Santa Fe was also much damaged. The Union Pacific Railroad between Boulder, Col., and Sunset, was badly damaged, practically throughout the whole length of the Sunset branch. Boulder was cut off from the outside world four days. The South Park division to Leadville was blocked four days, and the Colorado Central still longer.

Straggling bands of Coxeyites still make trouble here and there. A freight train on the Southern Pacific was captured near Pixley, Cal., last Saturday night by 175 of them. They were driven off by officers of the law the next day. At Boscobel, Wis., on the night of May 31, about 30 tramps boarded a passenger train and rode 25 miles in spite of the conductor's efforts to drive them off. At Parkersburg, W. Va., on Tuesday of this week, a crowd of 100 or 200 took possession of a Baltimore & Ohio freight train, but after some delay about 100 of them were arrested and placed in jail. At Ellis, Kan., last Sunday, 75 men who attacked a Union Pacific freight train were arrested and half of them were, according to the reports, taken back to Denver, Col., where Judge Haliett promptly let them off. The leaders of this band were imprisoned at Leavenworth. At Boise, Idaho, last Tuesday, most of the men arrested along the line of the Union Pacific in that region were sentenced to imprisonment for from one to three months each. A prison had to be built in order

to make room enough for them. The Judge spoke severely of the action of the people at Portland, Or., in sending the tramps eastward. The 35 tramps who stole a train at Arlee, Mont., were sentenced at Missoula, Mont., this week to 30 days' imprisonment for contempt of court, but 14 of the prisoners subsequently escaped. J. W. Kelley, a Coxeyite leader, was imprisoned for six months at Helena, Mont., May 30.

Business is very active in the anthracite coal region and prices of that coal have been slightly advanced. It is said that large quantities are being shipped to Cleveland and other Western cities as far as St. Louis, in box cars, an agreement being exacted from the railroad company not to confiscate the coal for its own use. The Erie road has sent instructors west to teach firemen how to burn anthracite. There are no special developments as regards the scarcity of fuel. Train service is reduced by the railroads wherever possible, and wood is being used in locomotives in some places. The Lake Shore & Michigan Southern is reported to be using wood on a few passenger engines. The roads between the Ohio River and Chicago are said to be carrying 300 cars of coal a day from river ports to Chicago and other Northern markets. Vessels on Lake Erie have had so much difficulty in getting coal that many are tied up in consequence. The West Virginia Central & Pittsburgh has reduced all salaries 25 per cent., on account of the shrinkage in business, and the Missouri Pacific has closed repair shops at five division terminals. The Wabash has closed its large shops for ten days. The Mobile & Ohio has decided to take off its hrough day passenger trains on the St. Louis Division.

NEW PUBLICATIONS.

Some General Statistics.—Mr. C. P. Leland, Auditor of the Lake Shore & Michigan Southern Railway, sends a chart, which he has compiled, of interesting and valuable statistics gathered from various sources and grouped for ready reference. The centre of the chart shows the average rate per ton per mile on the Lake Shore & Michigan Southern Railway for 40 years, that is, 1854 to 1893, during which time the rate has fallen from 3.51 cents to 0.587. The yearly rates are shown by a diagram showing a fairly regular decrease, except toward the end of the war and for a year or two after, when rates jumped up. That is, the rate per ton mile was 3.51 cents in 1855, 2.092 in 1859, 2.903 in 1865, 1.01 in 1875, 0.553 in 1885 (the minimum yet touched), and 0.587 in 1893. The tables show the mineral and agricultural production of the United States, receipts of ore at Lake Erie ports and other useful data.

TRADE CATALOGUES.

Steel and Iron Buildings.—The Building Department of the Shiffler Bridge Company, of Pittsburgh, Pa., issues an Album of Designs, being a volume of 138 pages, 9¼x12½ in., showing many views of iron and steel buildings, for various purposes, built by that company. Probably 125 or 130 different structures are shown by half tone engravings from photographs. This company, which was incorporated in 1890, was founded by J. W. Walker, in 1883, now President and General Manager, and took its name from Mr. A. G. Shiffler, a friend and associate of Mr. Walker, and the founder of the Keystone Bridge Works, of which he was at one time General-Superintendent. After seven years of successful operation the concern was converted into a stock company under its present name. The album gives a brief summary of the special advantages of iron and steel construction for mills, furnaces and the like, and gives many references to large and responsible firms for whom the company has constructed buildings and other iron work.

Hoisting Engines & Contractors' Machinery.—J. S. Mundy Newark, N. J., 1894.
The high character of the special machinery turned out by Mr. Mundy, and its great variety are well-known, and it would be superfluous to go through his new catalogue in detail. It shows engines for hoisting, bridge erecting, pile driving, logging, mining, quarrying and dredging, also derricks of various sorts, and a few other articles necessary for contractor's plant. The catalogue has 72 pages, with an alphabetical index, and gives size, capacity, weight and price of the various machines shown. The hoisting engines are fitted with Mr. Mundy's patent friction drum, now well-known all over the country, and which is, perhaps, unequalled in its combination of promptness and sensitiveness.

Fraser & Chalmers, of Chicago, manufacturers of mining machinery, steam engines, boilers, etc., after careful tests of the Jones Underfeed Mechanical Stoker, described in the *Railroad Gazette*, of Jan. 26, 1894, have commenced the manufacture of the device, and have just issued a circular setting forth its advantages, and describing its construction and mode of operation. This furnace is now quite extensively used in Chicago and other western cities, and is giving very good satisfaction.

The Case School of Applied Science, of Cleveland, Ohio, has recently issued a small pamphlet giving a short historical sketch of the school, and considerable information as to the scope of the instruction in each department. Several branches of engineering are taught, the length of the courses being four years in most cases. The pamphlet is well illustrated and shows general views of the buildings and grounds as well as several interiors of shops and class-rooms.

The Eubank Car Door Co., of St. Louis, Mo., have issued a circular describing its car door and giving directions for making and applying it. This door was illustrated in the *Railroad Gazette* of May 4.

The Weston Engine Co., of Painted Post, N. Y., has issued a new catalogue containing complete descriptions of the Western automatic high speed engines, with cuts of the various parts. Considerable information is given about its operation and maintenance, and some data of a general character that will be found of interest to those using high speed engines.

Railroad Matters in Chicago.

Freight Traffic.—The freight situation on the Western railroads does not improve, and those who have been predicting a material increase in the grain traffic of the lines centering here admit their disappointment at the showing made by the chief grain carriers, the aggregate shrinkage in the deliveries at Chicago last week by eleven leading lines being 2,795,000 less than for the corresponding time last year. But the latter were unusually heavy for the season. The movement of live stock was also smaller than anticipated, but the most serious shrinkage in in-bound freight was in coal, due to the action of the miners who not only refuse to allow the largest shipping mines to be worked, but interrupted the movement of coal trains on all the leading coal roads. The losses to the Illinois Central, Chicago & Eastern Illinois, and Atchison, Topeka & Santa Fe being very severe because of the number of mines which ship over those lines. The adverse influence of the mining troubles also materially affected the outward freight traffic from Chicago, because of the heavy shrinkage in trade with the mining sections which were largely supplied from here with provisions and miscellaneous goods that pay the best figures for transportation. The increased number of interior factories which were compelled to close for want of coal with which to drive their machinery also caused a further decrease in the shipments of materials to such concerns. The only gain in freight worth noting was over the Minnesota and Wisconsin Divisions of the Chicago Northwestern, and Chicago, Milwaukee & St. Paul, where a partial revival of iron mining is said to be giving the roads a fair increase in carrying iron ore and mining supplies, but the improvement there does not compensate for the diminution in other directions.

In view of the diminished coal traffic, and the scarcity of fuel, the roads have not only reduced work in their repair shops, but have withdrawn both freight and passenger trains on all divisions, only those which are necessary for the service being retained. In some cases there was an actual lack of fuel, but on some of the large lines the movement was precautionary.

The deliveries of grain (bushels) at Chicago by the leading Western railroads for the week ending June 2d, and the corresponding time the two preceding years compare as follows:

	1894. Grain.	1893. Grain.	1892. Grain.
N. West	991,000	1,196,000	272,000
Ill. Cent	394,000	867,000	380,000
C. R. I. & P	402,000	13,000	689,000
C. B. & Q	605,000	2,308,000	822,000
C. & Alton	117,000	169,000	173,000
C. & E. Ill	35,000	73,000	49,000
C. M. & St. P	473,000	805,000	562,000
Wabash	41,000	195,000	176,000
C. & Grt. W	133,000	198,000	262,000
A. T. & S. Fe	86,000	254,000	314,000
L. N A. & C	7,000	1,000	.....
Total	3,284,000	6,079,000	3,699,000

The following shows the deliveries of grain (bushels) at Chicago, by the leading Western railroads for the month of May, and for the same time the two preceding years:

	1894. Grain.	1893. Grain.	1892. Grain.
N. West	3,142,000	2,202,000	1,048,000
Ill. Cent	1,353,000	2,375,000	906,000
C. R. I. & P	1,582,000	82,000	1,317,000
C. B. & Q	2,544,000	5,064,000	2,764,000
C. & Alton	512,000	431,000	622,000
C. & E. Ill	120,000	283,000	232,000
C. M. & St. P	2,067,000	1,839,000	1,664,000
Wabash	621,000	620,000	393,000
C. & Grt. W	464,000	516,000	584,000
A. T. & S. Fe	540,000	2,082,000	1,197,000
L. N. A. & C	33,000	8,000	2,000
Total bush.	12,928,000	15,502,000	10,729,000

The following shows the deliveries of flour (barrels), received at Chicago by the leading Western railroads for the week ending June 2d and the two preceding years:

	1894. Flour.	1893. Flour.	1892. Flour.
N. West	10,350	18,392	15,149
Ill. Cent	750	790	.....
C. R. I. & P	9,295	7,800	3,500
C. B. & Q	9,366	13,186	9,956
C & Alton	4,650	795	4,925
C. & E. Ill	150	150	.....
C. M. & St. P	13,200	13,950	18,200
Wabash	1,916	600	1,500
C. & Grt. W	7,196	15,578	26,010
A. T. & St. Fe	.....	.....	147
L. N. A. & C	.....	.....	.....
Total	56,873	71,241	79,387

The deliveries of flour (barrels), at Chicago, by the leading Western railroads for the month of May, and for the same time the two preceding years compare as follows:

	1894. Flour.	1893. Flour.	1892. Flour.
N. West	46,304	84,243	79,879
Ill. Cent	1,650	3,140	420
C. R. I. & P	57,361	26,100	20,625
C. B. & Q	63,973	83,412	55,241
C. & Alton	27,756	4,465	18,151
C. & E. Ill	1,500	2,450	250
C. M. & St. P	47,350	91,120	64,100
Wabash	8,121	3,600	9,720
C. & Grt. W	30,026	86,817	69,797
A. T. & S. Fe	...	2,700	830
L. N. A. & C	...	...	...
Total bbls	284,041	388,047	319,013

The deliveries of live stock (cars), at Chicago, of all railroads for the month of May and for the corresponding time the three preceding years compare as follows:

	1894.	1893.	1892.	1891.
A. T. & S. Fe	802	989	915	1,147
B. & Ohio	3	2	14	7
C. & Alton	1,382	2,251	1,650	1,780
C. B. & Q	5,475	4,667	6,131	4,615
C. & Erie	13	24	9	5
C. & E. Ill	404	370	300	257
C. & C. Term	26	9	7	11
C. M. & St. P	3,406	2,580	3,430	2,476
C. & N. West	4,741	3,960	5,301	3,255
C. R. I. & P	2,974	2,697	3,136	2,137
C. & Grt. W	676	505	811	1,115
Ill. Cent	1,930	1,425	2,453	1,966
L. S. & M. So	34	18	19	14
L. N. A. & C	109	97	153	290
Mich. Cent	35	27	21	17
N. Y. C. & St. L	5	11	10	6
P. C. C. & St. L	48	217	81	41
P. Ft. W. & C	15	17	17	17
Wabash	1,005	1,900	1,349	1,449
Wis. Cent	176	89	129	103
Total cars	23,459	21,855	25,936	20,708

Passenger Traffic.—The recent complaints of light passenger traffic continue to be heard from all directions. The officials of the Western roads state that their through travel between Chicago and Western points fails to show any increase over the previous week. Interior local business was also unsatisfactory, and the strictly suburban business failed to improve, with the exception of a few lines which reach the most prominent suburban points. The complaint was that such business is poorer than at any corresponding time in years, and the prospects for an improvement in that direction not promising. The roads have all made tempting rates for excursions to summer resorts, but, judging from the drift of expressions by passenger agents, they are not very sanguine of a large travel in that direction, and on the whole the outook for even average passenger earnings the present summer are the opposite of flattering. The situation with the Eastern lines is equally unfavorable.

CHICAGO, June 4, 1894.

Railroad Uses of Compressed Air.

In the discussion on Air Brakes and Their Maintenance at the May meeting of the New England Railroad Club, Mr. F. M. Twombly, Master Mechanic of the Old Colony Division of the New York, New Haven & Hartford Railroad, gave the following interesting account of the applications of compressed air in the shops at Roxbury, Mass.:

I commenced the use of compressed air about two and a half years ago. The first thing I did was to make a hoist out of brass tubing, using for a piston rod cold rolled steel shafting. At that time we were taking up our rails on the Providence Division, and they were to be shipped to Cape Cod for a second track. We had to drill two holes in each end of the rail, and two men were employed with a suspended drill for this purpose, one man receiving $1.50 a day, and the other $1.75 a day, and at night they were pretty tired with their work. The rails were raised with a chain and fall, which had a one-ton lift, and cost $35. The hoist I constructed, and which I put upon this work, cost $28, and paid for itself in 15 days. I put up hoists all over the shop for lifting all kinds of machinery, and 42-in. passenger wheels. I rigged a radial run hoist for various uses, and I propose to put up one in place of the derrick we have been using. I have used the air for elevating purposes, for lifting a cab through the floor, laying the hoist horizontally. The power can be multiplied or divided, as on any block and fall. The one we use for lifting through the floor has a cylinder 15 ft. long. In that first hoist I spoke of, the diameter of the tube was 6 in., and its capacity 1,500 lbs. I put a cylinder under the floor of the room to lift up wheels. I force oil out of the barrels into the tank by means of this power, using a sliding pipe, letting a little compressed air on top of the oil in the barrel, and it is forced into the tank. A barrel of water can be emptied very quickly in that way. I am constructing a machine to take sand into a tank the same as water. In the tank shop, where we build tanks for the whole system, we construct a great many, and they are built upside down. We have formerly turned them over with a block and fall, but now we have hoists to handle those tanks by means of air. I use this power on a copying press; also to force oil on a bolt when cutting it. I take an auxiliary reservoir and fill it with oil, letting a little compressed air on the oil, and it can be applied to the work as you like, and when you want to run it into the tank again you remove your pressure and let it run back by gravitation. I have an overhead railroad in the yard, with hoists to load and unload cars, and for taking ashes out of tubs into cars, and use this power in many other ways. I am indebted to Mr. Medway, Superintendent of the Car Department of the Fitchburg Railroad, for plans for a pit for a pneumatic turn-table.

TECHNICAL.

Manufacturing and Business.

The incorporators of the New York Car Switch Co. are: E. T. Payne, 115 Nassau street, N. Y., S. F. Clouser, 221 Park place, J. S. Collins, Clarendon Hotel, Brooklyn, N. Y., and L. T. Duryea, Glen Cove, N. Y.

The tender of the Canadian Engine & Locomotive Works for the machinery for working the gates on the Saulte Ste. Marie canal in Canada, has been accepted. The price the company will receive will be above $30,000.

The Western Union Bridge Co., of Missouri, has filed a statement of consolidation with the Western Illinois Bridge Co., of Illinois, under the name of the Western Illinois Bridge Co. The directors live at Quincy, Ill., and Palmyra, Mo.

A destructive fire, started in the paint shop of the Laconia Car Works, at Laconia, N. H., on June 3, caused nearly $100,000 worth of damage to the company's property. The foundry and other buildings destroyed will be rebuilt at once.

The Merrill-Stevens Mfg. Co., with a capital of $25,000 has been organized at Niles, Mich., to manufacture and sell railroad cattle guards and railroad supplies. Eugene Cook, W. Wirt Stevens, Hester B. Stevens, all of Niles, Mich., are the incorporators.

The proprietors of the Milwaukee Bridge Iron Works will soon form a corporation to be known as the Milwaukee Bridge Iron Co., with R. G. Wagner, O. W. Wagner and W. J. Hahn as officers. Additional buildings will be erected and new machinery installed.

The arrangement by which the C. A. C. tie plate has been made and sold by the Standard Railway Equipment Co. has been terminated. A contract has been made with the Strait-Smith Co., of St. Paul, who will henceforth handle this device. The New York office of the firm is in the Vanderbilt Building.

The Foos Manufacturing Co., of Cleveland, Ohio, has had the continued good fortune of being supplied with orders sufficient to keep its men at work all through the present business depression. The company now has orders that will keep it busy till July to fill, at which time it will begin to prepare for the fall trade.

The Directors of the Michigan-Peninsular Car Company announce that they have decided not to declare any dividend on the capital stock for the present quarter. The continued business depression has prevented the re-opening of the shops. The company has a preferred capital stock of $5,000,000, on which it paid quarterly dividends of 2 per cent. from December, 1892, to September, 1893. No dividends have been declared since that time.

Pratt & Lambert, varnish makers, 47 John street, New York, in a pamphlet just issued, state that after a year's test of their varnish they commenced to solicit railroad business, and in the past three months they have supplied 32 railroads. They call particular attention to the fact that this has been done without railroad salesmen or personal visits. The pamphlet also contains extracts from letters received from some of the railroads using the varnish. It is claimed that this varnish is not affected by the sulphides of hydrogen (locomotive smoke) or ammonium generated in stables, and that in working it runs easily from the brush, besides possessing the usual desirable qualities of the best varnishes.

Reginald Canning & Co., the well known dealers in second hand, as well as new equipment for railroads, have lately opened an office in Philadelphia. Their New York office is still continued at 115 Broadway. Within the last three months this firm has sold 34 new cars, consisting of two parlor, five combination, one baggage and 26 passenger coaches to the South Jersey Railroad Co., the Phillipsburg & Altoona Railroad Co., and the Bedford & Alleghany Railroad Co., all of the above being placed with the Harlan & Hollingsworth Co., of Wilmington, Del. The firm has also had an active demand for second-hand coaches and combination cars, as well as open excursion cars. Mr. Edward T. Canby, who has lately associated himself as a member of this firm, has been in the iron and steel trade for 25 years, first with the Diamond State Iron Co., and later as Treasurer and Director of The Seidel & Hastings Co., of Wilmington, Del. He brings a thorough knowledge and long experience in all matters pertaining to bar and plate iron, fish plates, rails, bolts and nuts, all necessary in the equipment of railroads.

Iron and Steel.

The Lukens Iron & Steel Co., of Coatesville, Pa., has let a contract for a 105 ft. x 100 ft. iron building to the Shiffler Bridge Co., of Pittsburg, Pa.

There was a general resumption on June 4 at the plant of the Pennsylvania Steel Co., at Steelton, Pa., with encouraging prospects for work all summer. There are 3,500 men on the pay-roll, within 200 of the number working at this time last year.

T. J. Peters has been appointed Receiver of the Alabama Iron & Steel Co., of Brierfield, Ala., on the application of the Secretary of the company. The company was chartered in 1889 with a capital stock of $2,000,000, and bought out the old Brierfield Iron Co. There is a mortgage for $2,000,00 on the entire plant.

The directors of the Bessemer Land & Improvement Co., met at Bessemer, Ala., recently, and voted to organize a company to erect a steel plant at Bessemer, with a capital stock of $500,000. The Bessemer Land & Improvement Co. will own all the stock. In addition to this the steel plant company is to issue $500,000 of bonds, which will be guaranteed by the Bessemer Land & Improvement Co. A committee composed of Messrs. H. F. DeBardeleben, Smythe and Roberts was appointed to take immediate steps to put this plan into effect.

New Stations and Shops.

The West Virginia Central & Pittsburg Railroad will this summer build a new passenger station and offices at Elkins, W. Va. The building will be 75 ft. x 90 ft., three stories high, built of brick and stone.

The officers of the roads entering Galveston, Tex., are now considering a plan for the erection of a Union passenger station at that city. General Manager Yoakum, of the Gulf, Colorado & Santa Fe, General Manager Campbell, of the International & Great Northern, and General Manager Purdy, of the Missouri, Kansas & Texas, have recently held a conference to discuss the subject. It is proposed to organize a terminal company with a capital of $70,000 to build the station.

The plans of Bradford L. Gilbert, of New York, for the new station at Syracuse, N. Y., for the New York Central & Hudson River Railroad, have been adopted by the company. The main building is to occupy the site of the present Leland Hotel at Syracuse, and is to be about 94 ft. x 122 ft., with a tower 25 ft. square. The building will have north and south wings, 50 ft. x 104 ft. each, for the baggage and ticket rooms. A new freight house is also included in the present plans.

The Pittsburg Bridge Co. has a contract for the construction of an erecting shop for the Pittsburg Locomotive Car Works, which will take about 300 tons of steel.

The new office building of the Pennsylvania Railroad at Broad street, Philadephia, will soon be ready for occupancy and by September it is expected the entire official and clerical forces of the company, now located in the Fourth street offices, will be located in the new building. The directors' room is located upon the second office floor, fronting on Market street. It is a spacious apartment, finished in oak. On the same floor is the suite of offices appointed for President Roberts. On this floor will also be located the offices of Second Vice-President John P. Green, and the Secretary, John C. Sims. First Vice-President Thomson will have his office on the first office floor, directly beneath the office of President Roberts. The offices of Third Vice-President Pugh and the Treasurer will also be on this floor. On the fourth floor will be the offices of General Passenger Agent James R. Wood and the advertising department, and on the fifth floor will be the Comptroller's offices.

Growth of the Pintsch Gas System.

The diagram herewith gives an interesting view of the growth of the Pintsch system of car lighting in the United States from 1883 to 1894. Besides the cars equipped for Pintsch gas shown here some 51,000 are equipped in

Europe, and it is also in use in South America, India and Australia. As we have frequently had occasion to say, one great reason for the recent rapid growth of the system in the United States is the multiplication of charging stations of which the company now enumerates 53 distributed all over the Union.

The Torpedo Boats Cushing and Ericsson.

The launching of the torpedo boat Ericsson at Dubuque, Iowa, from the docks of the Iowa Iron Works on the Mississippi River, on May 12, and the recent successful trip of the torpedo boat Cushing from Washington to New York over inland waters, are incidents worth noting, as they may be the first steps in matters of great importance in the defense of our country. On June 10 the Ericsson will be taken to Pensacola, Fla., to receive her armament. The contract requires her to make 24 knots an hour, but she is expected to make 28 knots. She is fitted with Thorncroft tubular boilers and is to carry 250 lbs. steam pressure. Her contract price is $113,000. Her general dimensions are: Length, 150 ft; extreme beam, 15.62 ft.; beam at loadwater line, 15.5 ft.; normal draught, 4.75 ft.; normal displacement, 120 tons. The motive power consists of two sets of quadruple expansion engines of the vertical inverted direct acting type, operating twin screws of manganese bronze. The cylinders are 11½, 16, 21½ and 30 inches. The estimated horse power of the engines is 1,800, and the propellers are to make 412 revolutions to the minute at maximum speed.

The torpedo boat Cushing was built by the Government from designs by the Herreshoffs, and her Commander, Lieutenant Fletcher has made an interesting report of his trip from Washington to New York by the inland waters. The waters passed through by the Cushing include the Potomac river, Chesapeake bay, the Chesapeake and Delaware canal, Delaware bay, Upper Delaware river, Delaware and Raritan canal, Raritan river and bay to the New York Navy Yard. During the passage the Cushing carried ninety pounds of steam pressure in one boiler, which was capable of driving her fourteen knots an hour in open water. This pressure was reduced to forty pounds while passing through the canals, and the speed reduced. The distance covered was 349 miles; the actual running time in open water, exclusive of minor delays, was 21½ hours at about 14 knots per hour. The actual running time through the canals was 11½ hours at a speed of 5 knots per hour. The total running time between Washington and Brooklyn was 32 hours and 40 minutes.

THE SCRAP HEAP.

Notes.

A bill for the establishment of a government telegraph is again before Congress, but Postmaster-General Bissell, unlike his predecessor, opposes the project, as it would add enormously to the annual deficit without correspondingly advancing the interests of the public.

Senator Cullom has introduced in Congress a bill providing for the creation and appointment of railroad examiners to have access to the books and papers of the road on the order of bank examiners. The bill was introduced by request, and is neither originated nor endorsed by the Senator.

The discussion of "rapid transit" in Boston continues lively, at least in the newspapers, and the proposed bill to permit the construction of an elevated railroad on the Meigs plan has been again presented in the Legislature. The clause authorizing the State to provide $10,000,000 of the money for building the road is now left out.

The Cincinnati, New Orleans & Texas Pacific has secured an order from Judge Taft, of the United States Circuit Court, for deputy marshals to protect the road in case of a strike, which it is expected may ensue in consequence of the reduction of wages by the Receiver, which reduction the court refused to interfere with.

Mr. George C. Newcomb, a special agent of the Chicago & Western Indiana, was fatally shot in a passenger train of the Chicago & Grand Trunk near Chicago one night last week. It is said that this man was on the train for the purpose of detecting confidence men who robbed passengers, and there is some mystery about the shooting.

A "lunch-car" is a new feature on the summer excursion trains of the Lehigh Valley road. The car is 70 ft. long, handsomely fitted up, with a lunch counter extending along the whole length of one side. It was run on a day excursion from New York to Mauch Chunk, May 30. A restaurant of this style was run on the Philadelphia, Wilmington & Baltimore some 30 years ago.

Reports from Chicago this week are that the latest passenger agreement among the Western lines is in danger, owing to breach of faith of some of the members. It is to be hoped that all the roads will think twice—if necessary several times—before indulging in any further rate wars. If it is shown that some of the lines have violated the agreement, it would be much better for the presidents themselves to assemble before any retaliatory measures are taken, and try their hands at making a passenger agreement. Having just formulated a new freight agreement they should be prepared to speedily perform a like service for their passenger departments.

A Railroad Employees' Platform.

The convention of Railroad Employees in New York city last week was attended by about 200 delegates. Mr. E. E. Clark, of the Conductors' Brotherhood, presided. System federation was approved. A "platform" was given out, the main points of which were as follows: The convention voted in favor of a compulsory arbitration law. It voted in favor of electing Railroad Commissioners by a direct vote of the people in the various States, instead of their being appointed as at present. The recent decision of several Federal judges on questions of rights and liberties of working men are denounced as unjust, unconstitutional and un-American; but Judge Caldwell is excepted from this denunciation.

The Pass Swindler Again.

Within the past few days several cases of bogus requests for railroad passes have been brought to our notice. A letter dated April 18 was addressed to C. W. Bradley, General Superintendent of the West Shore Railroad, requesting transportation for C. W. Palmer and wife, New York to Buffalo; another on April 19 was sent by messenger to J. W. Reinhart, President of the Atchison, Topeka & Santa Fe, asking for a pass for a Mr. Selby to Denver, and also for one for Charles George Willoughby to Los Angeles. Both of these were written on regular letter-head paper of the Missouri, Kansas & Texas, Railway, with the signature of Charles G. Hedge, Secretary and Treasurer of the company, forged by the writer. In the first letter Mr. Palmer was represented as an employee of the M., K. & T.; and in the other Mr. Selby was a supposed employee and Charles George Willoughby was put down as a cousin of Mr. Henry C. Rouse, Chairman and President of the M., K. & T. Mr. Hedge thinks the paper used for these letters was procured from his office by a young man who requested the privilege, which was accorded him, of writing a note to Mr. Rouse, whom he claims as a cousin.

Canal Projects.

The bill for a survey for a deep water route from the lakes to the Hudson River, which followed the Waterway Convention at Detroit, and died in the last Congress, has come up again in this Congress. The Committee on Railroads & Canals has recommended an appropriation of $50,000 for a survey, without designating any route. This will necessitate the investigation of Mr. Sweet's project for the radical enlargement of the Erie Canal, and also the rival plan of a route which will utilize Lake Ontario as a part of its waterway.

The same committee recommends an examination of the three rival routes for a ship canal between Lake Erie and the Ohio, viz.: From Conneaut to the North of the Beaver, near Pittsburg: From Cleveland via. the Muskingum to Marietta, and from Toledo to Cincinnati.

The canal connecting Montreal with Lake Huron is again being talked about. It is urged both as a means of increasing the prosperity of Montreal and as a defensive measure. Both the Dominion and Imperial Governments are urged to guarantee bonds in aid of the work.

Elevated Railroad Damage Suit in Chicago.

The first suit filed in Chicago against an elevated road for damages resulting from its operation, was recently instituted by the owner of an apartment building which was erected a year before the construction of the "Alley L."

road. It is represented that in consequence of the operation of the road, rentals have greatly decreased, and that the vibration set up by the frequent passage of the trains has cracked the walls of the building. Obstruction to light and air, annoyance from smoke and cinders, and noise, are nuisances which it is alleged that the road has created.

Lake and Canal Notes.

The Erie Canal is doing a very good business for volume, but at low rates, carrying 6,808,746 bushels this May as compared with 5,505,041 bushels last.

The war between the floating and fixed elevators in Buffalo has resulted in a rate of $2\frac{1}{8}$ cents for corn from Chicago to New York, including the Buffalo transfer.

A steamer ran into one of the lock gates of the Welland Canal at Port Dalhousie on the 31st ult., doing about $7,000 damage, and suspending navigation for several days, until the lock gate can be repaired.

There was a launch on Thursday, May 31, at the Chicago ship building yards, of the "Kearsarge," a steel steamer 346 ft. long, 44 ft. wide and 27 ft. 6 inches moulded depth. She has triple expansion engines, and is intended for either a coal and ore, or package carrier. For the two purposes she is provided with 9 hatches and 12 gangways, 6 on each side. Her keel was laid on February 5, and she is expected to be out of the shipyard on the first of July.

The Railroad Disaster in Salvador.

A press report from San Francisco gives further particulars, said to be from a reliable source, of the railroad disaster at Santa Ana, San Salvador, on May 3. The number killed is reduced, but still is larger than was ever reported in any railroad accident before, except that at Mailpois, Mexico, on June 24, 1881, where 214 soldiers, besides trainmen and many others, were killed. It appears that on May 3 President Ezeta of Salvador went to the assistance of the city of Santa Ana, which was threatened by rebels. Fifteen hundred men were placed on a special train, which started for that town. The insurgents, learning of the approach of the government troops, removed the rails from the track on a steep grade several leagues from Santa Ana. The train was running fast, and eight cars were wrecked. Fully 200 men were killed and 122 wounded. President Ezeta had a narrow escape.

Freight Shipments from Lake Superior.

There are about 400,000 barrels of flour in store at the west end of Lake Superior awaiting eastern shipment. Because of the great storm on the lakes last week very little, comparatively, has been shipped in the past ten days. Mills at Duluth and Superior are furnishing about 80,000 barrels a week to stocks, the rest being rail receipts from Minneapolis. A large flour cargo is 25,000 barrels, so there are now ready for shipment 16 cargoes of flour alone.

Iron ore shipments from the head of the lakes to the close of last week were 277,000 tons for the season, about half from the Vermilion and the Mesaba ranges. The Chandler mine on the Vermilion has taken first place among Lake Superior mines, with an output to date of 77,000 tons. Shipments are far in excess of the quantity to this date last year.

Owners of lake craft complain bitterly of the prices obtained for freight. From the head of the lakes the lower Lake Erie ore brings 80 cents a gross ton, while wheat is 2¼ cents a bushel.

Five years ago at this time wheat charters were plenty at 1¼ cents. The outlook at present is for higher freights, especially when coal begins moving.

The coal strike will have a very serious effect on lake traffic, and in a week or ten days will tie up nearly all the large carriers. All the vessels plying to the head of the lakes are now drawing on coal stocks at Duluth and Superior for fuel, while the railroads have purchased the remainder of coal on dock, and are shipping it south at the rate of about 4,500 tons daily. At the opening of navigation there were unsold stocks on dock at the head of Lake Superior of 350,000 tons. Now there are only 100,000 tons in stock, all sold, and being reduced at the rate of 6,000 tons daily. Not only are railroads reaching the head of the lakes drawing supplies from these docks, but all the Northwestern and several of the Western roads reaching from Chicago are securing fuel from these coal stocks. In twenty days or less the docks at all upper lake points will be bare of bituminous coal. In consequence the lake coal movements later in the season will be much larger than ever before, and higher freight rates will be in force.

The mammoth ore dock of the Rockefeller iron syndicate, at the head of Lake Superior, is being doubled in capacity, giving loading room for 16 of the largest lake craft at one time.

South American Notes.

The Uruguayan Government has removed all duties from automatic brakes for railroad cars.

A company is being formed by Engineer Andreoni to supply Montevideo with water from the Department of Minas.

Joseph G. Hemster, C. E., has arrived at Antofogasta, Chili, where he will prosecute the surveys for the proposed railroad to Aguas Blancas.

The importations of railroad material into Chili for the year 1893 amounted to $250,000, as against $185,000 in 1892. Importations of general iron and steel manufactures show a decrease ranging from 10 per cent. to 55 per cent.

Since January 1, 1894, the Southern Brazilian Railway has sent out for repairs of permanent way 15,000 steel sleepers, costing, delivered at Rio Grande do Sul, $1.12 apiece. The cost of pine ties delivered at the same point is 77 cents each.

The Argentine Government has decreed a payment to the guaranteed railroads, pro rata on the amounts due to each, of a gross sum of $2,000,000 gold. The total amount of unpaid guarantees up to December 31, 1893, was $8,732,805.

The Argentine Public Works Department has recommended expenditures for work on the southern entrance of the port of Buenos Ayres of $400,000; for the construction of walls of defence of $500,000, and for increase of rolling stock for the national (state owned) railroads, of $240,000, gold.

In consequence of a recent accident at a street crossing on the Ensenada Railway, within the precincts of Buenos Ayres, the Argentine Railroad Board has issued orders that electric bells, or other signals, shall be provided at all crossings. This order is evidently intended to affect all railroads entering Buenos Ayres.

The Department of Industry and Public Works in Chili has issued a call for tenders for the completion of the Valdivia & Pichi-Roquilli Railroad, the bids of Don Adolfo Nicolay and Don Alfredo Schatzmann having been rejected, the former on account of non-conformity with the specifications, and the latter because of excessive price.

The Central Argentine Railway carried during the year 1893 passengers to the number of 2,671,454, and freight to the amount of 1,188,684 tons. The train mileage was 1,949,544, and receipts per train mile were $1.59, as against $1.38 for 1892. The gross receipts were $3,029,754, being an increase of 17.11 per cent. over the previous year. The working expenses were reduced from 65.53 per cent. in 1892, to 58.47 per cent. in 1893, leaving a net revenue of $1,258,715, being a gain over 1892 of 41.12 per cent. The traffic is increasing so rapidly that the company will provide new freight cars in time for the next wheat crop, and it will build at its own shops a number of new passenger cars to meet the demands of the growing suburban traffic on the Buenos Ayres section.

If You See It in the Sun It's So—Sometimes.

A favorite form of sport on the Continent is racing between bicyclists and express trains. The bicycle almost always wins. The other day a mechanic named Garz bet that he would beat the express train from Rummelsburg to Friedrichshagen, distance 11¼ miles, by ten minutes. As the train moved from the station, Garz swung himself upon his bicycle and was soon out of sight. He reached the goal ten minutes before the express, having done the distance in thirty-two minutes.—*New York Sun.*

For Calming the Waves.

According to the *Comptes Rendus*, soap water as a means for calming waves, applied in much the same way as that in which oil is used, was recently tried by the French steamer Le Senegal, belonging to the Compagnie des Messaeries Maritimes. The experiment was made during a stormy trip on the Adriatic Sea, and is said to have given very satisfactory results.

What We Learn from England.

Our esteemed contemporary, *Herapath's Railway Journal*, in explaining to the new President of the Board of Trade, Prof. Bryce, the environment of his position, says: "An intimacy with the Interstate Commerce Act is not the best qualification for approaching railway problems in this country; but, if Mr. Bryce is up to date in his information on this head, he will observe that the Interstate Act has worked untold mischief all round, and that the Railroad [Interstate Commerce] Commissioners themselves are loudly calling for its repeal." Not so very loud, so far as we have observed.

Courts of Engineers.

A certain Austrian, Zschokke, has lately revived a proposition, already discussed on several previous occasions, that all legal controversies involving engineering considerations should be brought up for argument before a court made up of engineering experts and not of judicial officers only. Special prominence has been given to the matter abroad during the past few years by such deplorable accidents as the well-remembered Mœnchenstein bridge collapse in Switzerland, the disastrous railroad collision at Zollikofer, and the more recent explosion of a boiler on one of the steamers plying on Geneva Lake. In all of these cases there was heavy loss of life, entailing legal proceedings in which considerable expert engineering testimony was offered on both sides, but in none of them was a verdict obtained against the defendants, owing, as Professor Zschokke argues, to the fact that the courts themselves did not possess the necessary engineering qualifications to enable them to properly estimate the values of the pros and cons. In all such cases as those cited, Professor Zschokke therefore advocates the constitution of a court, or judiciary committee, consisting of, say, eight or ten engineers of acknowledged prominence, with one of the federal judges acting as chairman. Such a committee would be thoroughly fitted to intelligently weigh the evidence submitted and to decide wisely where the responsibility for an accident belongs. There are, as Professor Zschokke says, military, commercial and marine courts, based on the principle that only those thoroughly versed in the subjects coming under those heads can give them their proper share of consideration. Why, therefore, should there not be engineering courts with equal propriety?

LOCOMOTIVE BUILDING.

The Brooks Locomotive Works of Dunkirk, N. Y., have received an order for 30 freight and 30 passenger locomotives, from the Central Railroad of Brazil, which is a meter gage road. This order was placed through the firm of Flint & Co., of New York, the prominent South American house.

CAR BUILDING.

The Bloomsburg Car Co. is crowded with orders, and the shops are running a full force of men, 13 hours a day.

BRIDGE BUILDING.

Bedford, Pa.—The county commissioners have awarded contracts for the erection of five new iron county bridges respectively 118, 115, 75, 66 and 60 ft. in length, the total cost of the superstructures being $5,082. The contracts for masonry let, ran from $2.75 to $3.47 per square yard.

Charleston, W. Va.—The County Court of Kanawha County, W. Va., J. W. Goshorn, clerk, will receive bids until June 9 for a new steel bridge about 70 ft. long, over Burning Springs Branch in that County.

Corning, N. Y.—Highway Commissioner Zeak has let the contract to the Horseheads Bridge Co. for three iron bridges. The total cost is about $1,050. There were bids from the Canton Bridge Co., of Canton, Ohio, the Groton Bridge Co., the Oswego Bridge Co., and the Horseheads Bridge Co.

Gettysburg Pa.—Proposals will be received by the county commissioners until June 12, for the construction of a bridge over Marsh Creek at Bingham's Fording.

Harrisburg, Pa.—An ordinance was introduced into the Common Council, May 28, authorizing the application to the commissioners for the building of a bridge over Paxton Creek at Maclay street, to take the place of the present structure which has been condemned by a grand jury.

Hawkinsville, Ga.—Proposals will be received until June 13, for placing two 60-ft. iron spans in place of the present wooden approaches to the drawbridge across the Ocmulgee River.

Indiana, Pa.—Nelson & Buchanan, of Chambersburg, Pa., have been awarded the contract for the 55-ft. iron bridge across Sine Run, near Kellysburg. Their bid was $900. The old wooden bridge at Smicksburg will be replaced by an iron one. The new structure will be 50 ft. longer than the present bridge.

Lorian, O.—The county commissioners will probably accept the proposition of Congressman T. Johnson, who offers to pay one-third the expense of replacing the old iron bridge across the west fork of the river with a stone arch structure of greater width, and to cost over $15,000.

Morristown, Pa.—The cloudburst of May 28 did considerable damage to county and township bridges in this county. It is estimated that $50,000 will be required to replace the washed-out structures.

In Flourtown and vicinity six township bridges are gone, most of them over tributaries of the Wissahickon. Bridges were swept away at the following points: Morris avenue, Bryn Mawr, Cameron's Lane, Brookfield, Black Rock, Glenwood, Murray's Mill, State Bridge, Booth's Mill, Chadwick's Mill and Toddtown.

New Orleans.—Mr. E. L. Corthell expects to take up his headquarters in New Orleans in a few days to supervise the construction of the Mississippi River bridge above the city, which is being built from his plans. It is announced that the plans and specifications for the bridge have been completed and work upon the foundations will be commenced immediately.

New York City.—The United States Senate has passed the bill to authorize the construction of the New York and New Jersey bridge across the Hudson River at New York city. The Senate made several amendments to the bill as it passed the House of Representatives. One of these defines the term approaches to include only such part of the structure as is necessary to reach the grade of the streets from the grade of the bridge. The height of the bridge is to be measured from the center of the span, and the Secretary of War is to have power to review the decision of the Board of Engineers. In the House bill the Board of Engineers had power to decide only upon the practicability of a bridge of a 2,000-ft. span over the river. The House on Tuesday passed the bill as amended by the Senate.

Philadelphia.—The House of Representatives passed the bill authorizing the construction of a bridge across the Delaware River between Philadelphia and Camden.

Pittsburgh, Pa.—The Schultz Bridge & Iron Co., of McKees Rocks, has been awarded contracts from the Department of Public Works, of Pittsburgh, to erect two bridges over the Baltimore & Ohio Railroad tracks in the 23d ward, to cost about $55,000.

Scranton, Pa.—The contract for the steel bridge over the gorge at Nay-Aug Falls, was awarded June 2 by the building committee of the Nay-Aug Falls & Elmhurst Boulevard Co., to the Pottsville Bridge Co., Pottsville, Pa. The contract for the sub-structure was awarded to Muldoon & Bowle, of this city. The bridge will be 40 ft. long and 125 ft. above the water.

Sunbury, Pa.—The commissioners last week opened the bids for building iron bridges at Cameron street, Milton, Yeagle's Mill in Delaware Township, and Muddy Run in Turbot Township. The largest of the three is the one at Yeagle's Mill. It was given to the Pottsville Bridge Co., for $1,650; the one at Cameron street, Milton, to George W. Keefer for $1,355; the Muddy Run bridge was also given to Keefer for $749.

Westfield, N. Y.—At the special town meeting held on June 7 the proposition to raise by tax an amount not to exceed $15,000 for the construction of a new bridge on Main street, across Chautauqua Creek, was defeated by 75 majority. The present iron bridge was built 20 years ago, and has been condemned by the State engineers.

Williamsport, Pa.—The commissioners of Lycoming County will advertise for bids for rebuilding the Market street bridge in a few days. It has been practically decided that only one river bridge will be built for the present.

Winnipeg, Man.—At a meeting of the Winnipeg Board of Works, City Engineer Ruttan presented his report on the tenders for the superstructure of the Boundary street bridge. He recommends that a plan be prepared by the city, and new tenders invited. It is likely an iron superstructure will be called for.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Albany, 2 per cent., payable June 30.
Boston & Lowell, 3½ per cent., payable July 2.
Delaware & Hudson Canal Co., quarterly, 1¾ per cent., payable June 15.
Philadelphia, Wilmington & Baltimore, semi-annual, 3 per cent., payable July 2.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago, St. Paul, Minneapolis & Omaha, annual, Hudson, Wis., June 9.
St. Joseph & Grand Island, annual, Elwood, Kan., June 12.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Car Builders' Association* will hold its annual convention at Saratoga, N. Y., beginning June 12. The hotel headquarters will be at Congress Hall, H. S. Clements, Manager.

The *Master Mechanics' Association* will hold its annual convention at Saratoga, N. Y., beginning June 18.

The *National Association of Local Freight Agents* will hold its annual convention at Pittsburgh, Pa., June 12, 13, 14. The headquarters will be at the Monongahela House.

The *International Association of Car Accountants* will hold its annual convention at Old Point Comfort, Va., beginning June 19.

The *American Society of Mechanical Engineers* will hold its annual convention in Montreal, Can., from June 4 to 9 The headquarters will be at the Windsor Hotel. The sessions of the society will be held in the Engineering Building of McGill University.

The *Western Railway Club* meets in the rooms of the Central Traffic Association, Monadnock Building, Chicago, on the third Tuesday in each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York city, on the third Thursday in each month, at 8 p m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m. The annual convention will be held at the Cataract House, Niagara Falls, N. Y., beginning June 20.

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 51 Lakeside Building, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7.30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second and fourth Tuesdays of each month except during July, August and December, when they are held on the second Tuesday only.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday in each month, at 8 p. m.

Master Mechanics' Association.

The reports of committees to be presented at the 27th annual convention are as follows, names of Chairmen only being given:

Cracking of Back Tube Sheets, T. B. Purves.
Oiling Devices for Long Runs, J. Davis Barnett.
Locomotive Fire Kindlers, John Hickey.
Exhaust Nozzles and Steam Passages, Robert Quayle.
Boiler and Fire-box Steel, A. W. Gibbs.
Sanding Devices, O. Stewart.
Special Shop Tools, T. W. Gentry.
Standard Tests of Locomotives, J. N. Lauder.
Fire Treatment, A. E. Mitchell.
Cost of Maintaining Locomotives, G. W. Rhodes.

Master Car Builders' Association.

The first session of the 28th annual convention will be called to order at 9 a. m., on Tuesday, June 12, in the ball room at Congress Hall. Under "Reports of Committees" the following business has been arranged. Only the name of the Chairman of each committee is given:

Indelible Pencils; R. P. C. Sanderson.
Standard Sizes for Catalogues, Specifications, etc.; G. W. Rhodes.
Tests of M. C. B. Couplers;. J. M. Wallis.
Air-brake Tests; G. W. Rhodes.
Steel-tired Wheels; R. E. Marshall.
Road Tests of Brake Shoes; R. H. Soule.
Laboratory Tests of Metal for Brake Shoes; S. P. Bush.
Brake Beams; E. D. Nelson.
Safety Chains for Freight Cars; H. Coulter.
Heating Passenger Equipment; W. L. Hoffoecker.
Ventilation of Passenger Equipment; R. P. C. Sanderson.
Lighting Passenger Equipment; C. A. Schroyer.
Wheel and Flange Gauges; J. N. Barr.
Lubrication of Cars; A. M. Waitt.
Air-brake and Hand-brake Apparatus on Cars; E. D. Bronner.
Compresesd Air Appliances and Hydraulic Machinery; J. C. Barber.
Freight Car Trucks; J. J. Hennessy.

Order of Railway Telegraphers.

This association held its annual convention at Denver, Col., last week. Mr. W. V. Powell, of Wichita, Kan., was elected Grand Chief Telegrapher, in place of D. G. Ramsay. It was decided to move the headquarters of the association from Vinton, Ia., to St. Louis.

American Society of Civil Engineers.

The following papers for the convention have been received and accepted:

Wire Rope Tramways, by A. C. Savage; Hoisting Apparatus of the Canal Head Gates at Sewall's Falls, N. H., by J. R. Freeman; Marking Street Lines, by C. M. Broomall; Brafford's Ridge Tunnel, by C. W. Staniford; Tequixquiac Tunnel, Valley of Mexico, by A. J. Campbell and F. W. Abbott; Quality of Water Supply, by J. W. Hill; Sand Rock Sewers in St. Paul, by George L. Wilson; The Cippoletti Trapezoidal Wire, by A. D. Flynn and C. W. D. Dyer; Submarine Removal of Rock, to a depth of 35 ft. Below Mean Low Water, by J. A. Bensel.

The additional papers thus far promised are: Friction Rollers, by C. L. Crandall and A. Marston; Railroad Signaling, by J. P. O'Donnell; Improvement of Gray's Harbor, by B. W. DeCourcy; Halsted Street Lift Bridge, Chicago, by J. A. L. Waddell; Determining the Load Line on a Telephone Exchange, by A. V. Abbott; On Testing of Building Stones, by F. Lynwood Garrison; The Sewerage System of Meriden, Conn., by C. Ph. Bassett; The Power Plant of the Cliff Paper Company, Niagara Falls, by W. C. Johnson; Remuneration of Engineers, by T. C. Clarke; Chatauqua Sewage Disposal, by W. B. Landreth; Field Notes of Railroad Surveys, by Arthur Pew; Philadelphia Harbor Improvement, by L. M. Haupt; Operation of Elevated Roads by Electricity, by. W A. Knight.

Railway Telegraph Superintendents.

The Association of Railway Telegraph Superintendents will hold its annual meeting at Detroit, Mich., on June 13.

PERSONAL.

—Mr. E. H. Whorf has resigned as Assistant Manager of the Mexican Central in consequence of ill-health.

—Mr. A. H. Porter, road master of the Macon & Northern, has been appointed Superintendent of the road to succeed Mr. S. C. Hoge, who is now Division Superintendent of the Central Georiga.

—Mr. E. Ellery Anderson, of New York, has resigned as joint receiver with C. H. Bosworth of the Chicago, Peoria & St. Louis Railroad. Mr. C. H. Bosworth has been continued in full charge by order of the court, with headquarters at Springfield, Ill.

—Mr. John W. Dickinson has been appointed Division Superintendent of the Southern Division of the Gulf, Colorado & Santa Fe, with headquarters at Temple, Tex. Mr. Dickinson was formerly Train Master of the Northern Division with headquarters at Cleburne.

—The successor of Hon. A. J. Mundella as President of the British Board of Trade, is Professor James Bryce, who is well known in this country as the author of "The American Commonwealth." Professor Bryce is 56 years old. He first entered the House of Commons in 1880.

—A. Dolbeer, formerly Superintendent of Motive Power of the Buffalo, Rochester & Pittsburg, and Master Mechanic of the Lehigh Valley in Buffalo, when the road was operated by the Philadelphia & Reading, has been made General Foreman of the Florida Central & Peninsular shops at Tallahassee, Fla.

—Mr. S. Y. McNair has been appointed Auditor of the Cleveland, Akron & Columbus road, to succeed Mr. H. P. Taylor, resigned. His office will be at Cleveland. Mr. McNair is well known as a railroad accountant. For many years he was chief clerk to the Comptroller of the New York, Lake Erie & Western. He resigned that position to become auditor of the Interstate Commerce Railway Association.

—Mr. W. C. Cushing, Engineer of Maintenance of Way of the Indianapolis Division of the Pennsylvania lines, has been transferred to the Pittsburg Division, and M. L. Byers, of the Cincinnati & Muskingum Valley, has succeeded Mr. Cushing on the Indianapolis Division. Mr. Cushing was appointed to the vacancy caused by the promotion of Mr. F. T. Hatch to be Superintendent of the Michigan Division of the Vandalia road.

—Mr. J. H. Barrett, whose resignation as General Superintendent of the Buffalo, Rochester & Pittsburg was announced last week, is to be General Superintendent of the Cleveland, Akron & Columbus and the Ohio Southern Railroad, which, though operated separately, are controlled in the same interest. No appointment will be made to the office of the General Manager, resigned by Mr. N. Monsarrat. Mr. Barrett will be in charge of the operating department on both railroads.

—Mr. Charles Neilson has been appointed Second Assistant Postmaster-General of the United States, vice Mr. J. Lowrie Bell resigned. Mr. Neilson has been Assistant Superintendent of the Railway Mail Service since September last. In his new position he will retain jurisdiction over that branch of the Post-Office service. Mr. Neilson was General Superintendent of the Cincinnati, Hamilton & Dayton road before going to Washington.

—Mr. J. P. O'Donnell, Signal Engineer, of London, is now in New York, and will remain in the country until after the convention of the American Society of Civil Engineers at Niagara Falls, where he will read a paper on Block Signaling. Mr. O'Donnell is well-known to signal engineers in America, not only from his writings and his very successful work in England, but as having been recently Consulting Engineer of the National Switch & Signal Company.

—President Van Horne, of the Canadian Pacific Railroad, has been created a Knight Commander of the Order of St. Michael and St. George. Queen Victoria has, before this, shown her appreciation of the value of the work done by other able railroad men in developing England's great dependency, by conferring the honor of knighthood upon the managers of Canada's older railroad, the Grand Trunk, for we now have Sir Henry Tyler, and Sir Joseph Hickson, as well as Sir William Van Horne.

—Mr. Charles Hansel, C.E., at present Western Manager of the National Switch & Signal Co., of Easton, Pa., has been elected Vice-President and General Manager of that company, with offices at 32 Liberty street, New York. Mr. H. M. Sperry, who for some years has been connected with the Johnson Signal Co. as General Representative, has tendered his resignation to take effect June 10. Mr. Sperry has been appointed as Western Agent of the National Company, with offices in the Monadnock Building, Chicago. Mr. George H. Hansel has been elected Secretary and Treasurer of the National Switch & Signal Co., with offices at the works, Easton, Pa.

—Mr. J. Lowrie Bell has been appointed General Traffic Manager of the Central of New Jersey Railroad. This is a new office created for Mr. Bell, who has recently been Second Assistant Postmaster-General of the United States. He became connected with the Post Office Department in 1889, when he was appointed by Postmaster-General Wanamaker to be Superintendent of the Railway Mail Service, where his experience in railroad affairs enabled him to make many improvements in the service. He was so successful in the administration of this department that in September, 1890, he was made Second Assistant Postmaster-General, where he had to make the awards of the contracts for carrying the mails on railroads, steamboats and star routes, the Department of the Railway Mail Service being included in the jurisdiction of the office when Mr. Bell was appointed. He has continued in that position under the change of administration, and his resignation is now entirely voluntary. Mr. Bell was for some years General Traffic Manager of the Philadelphia & Reading Railroad, and held that office until 1888. Mr. Bell expects to take a short vacation, and will assume his new duties with the Central of New Jersey about July 1.

—Mr. W. H. Jaques has resigned from the Bethlehem Iron Co., and in association with Mr. Horace See, has formed the firm of See & Jaques, engineers and naval architects, with office at No. 1 Broadway, New York. Both these gentlemen are so distinguished as engineers, and have been so prominently identified with advancing scientific principles in ship construction and naval ornament, that nothing need be added to the announcement that hereafter they are to be associated to develop questions of ship design. Mr. See has been established in New York since 1889 as Consulting and Superintending Engineer, and he will continue as Superintendent of the several shipbuilding and steamship companies with which he has become associated. Mr. Jaques resigned from the United States Navy in 1886 to inaugurate the manufacture of heavy ordnance and armor at the Bethlehem Iron Works. He will give special attention to the manufacture and treatment of guns, armor, shafting and other war material, the machinery required for their production, and especially with the fluid compression and hydraulic forging of steel and the best types of armor.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fé.—H. R. Nickerson has resigned the position of General Superintendent of the Railroad, and will be succeeded by H. U. Mudge, who has been Superintendent of the lines west of Dodge City, Kan. Charles Dyer, Superintendent of the New Mexico Division will succeed Mr. Mudge. J. E. Hurley, Assistant Superintendent of the Chicago Division will be made Superintendent of the New Mexico Division, and C. B. Strohm, Trainmaster of the Southern Division, will succeed Mr. Hurley

Atchison, Topeka & Santa Fe.—The changes produced by Mr. Nickerson's resignation as General Superintendent of the Eastern lines are as follows: H. U. Mudge, now General Superintendent of the Western Grand Division at Colorado Springs, succeeds Mr. Nickerson, with headquarters at Topeka, Kas. Charles Dyer, now Superintendent at Las Vegas, succeeds Mr. Mudge. J. E. Hurley, Assistant Superintendent at Fort Madison, and formerly of Topeka, succeeds Mr. Dyer. Charles Strohm, now Train Master at Arkansas City, succeeds Mr. Hurley. These changes take effect June 10.

Binghamton, Pennsylvania & Southern.—The directors are E. O'Connor, Frederick E. Ross, Charles Davis, of Binghamton, N. Y.; W. H. Jessup, Jr., Horace C. Hand, Melville Corbett, of Scranton, Pa.; Edward W. Ross, Silver Lake, Pa.

Boston, Concord & Montreal.—At the annual meeting held May 28, the following directors were elected: S. S. Kimball, L. C. Pattee, N. S. Clark, N. Turner, F. P. Weeks, C. E. Morrison, C. A. Bussell, N. S. Hunt and C. H. Bowles.

Chicago, Peoria & St, Louis.—W. M. Bushnell, Commercial Agent at Peoria, Ill., has been appointed General Freight Agent to succeed H. E. Pilcher, resigned, with headquarters at St. Louis. James Mann has been appointed General Agent of the Freight and Passenger Departments with headquarters at Peoria. W. J. Robinson has been appointed Local Freight Agent at Peoria.

Conestoga Valley.—At a meeting held at Cænarvon, Ia., last week, the following officers were elected: President, J. H. Jacobs; Secretary and Treasurer, D. M. Hartz; Directors, Dr. D. Heber Plank, Jacob Hartz, Daniel Z. Mast, Henry M. Hertzler, D. M. Hartz, B. F. Kurtz and J. M. Schertz. A charter will soon be applied for.

Fitchburg.—A circular has been issued announcing the appointment of G. E. Byram as General Baggage Agent, with office at Causeway street passenger station, Boston, vice G. F. Foye, resigned.

Forth Worth & Rio Grande:—Oscar White has resigned as General Freight and Passenger Agent, and B. T. Booze has been appointed to succeed him.

Gulf, Colorado & Santa Fé.—John W. Dickinson has been appointed Division Superintendent of the Southern Division, with headquarters at Temple, Tex., Vice C. S. Hayden, resigned. M. R. Pendel succeeds Mr. Dickinson as Trainmaster at Cleburne, Tex.

Jacksonville, Louisville & St. Louis.—C. M. Stanton, General Manager, has announced the following appointments: George W. Dye, Auditor; J. W. Daly, General Agent of Passenger Traffic, and J. B. Stevenson, General Agent of Freight Traffic, with offices at Jacksonville, Ill.

Leavenworth, Topeka & Southwestern.—C. T. McLellan, receiver of the company, has announced the following appointments: F. C. Gay, General Freight Agent; George T. Nicholson, General Passenger Agent; R. B. Gemmell, Superintendent of Telegraph; P. Walsh, General Baggage Agent; C. W. Konns, Car Service Superintendent, all with headquarters at Topeka, Kan. All of those named hold similar positions on the Atchison system.

Little Rock, Hot Springs & Texas.—This company has been permanently organized at Hot Springs, Ark., by the election of officers as follows: President, D. C. Rugg, Vice-President William J. Doole, Secretary and Treasurer, John G. Lonsdale; Directors, D. C. Rugg, J. G. Lonsdale, J. G. Latta, W. J. Cole, John J. Sumpter, E. Hogaboom, C. N. Rix, A. Whittington and R. L. Williams.

Natchez, Red River & Texas.—The annual meeting was held at Natchez, Miss., May 26, and the following were elected directors: Hugh Porter, George W. Debvoise, L. Hale and William H. Murphy, of New York, and Steven E. Rumble, Louis Botto and C. A. Gardner, of Natchez. The directors organized by electing the following officers: President and Treasurer, Hugh Porter, Vice-President and General Manager, C. A. Gardner; Secretary, William H. Murphy.

RAILROAD CONSTRUCTION,

Incorporations, Surveys, Etc.

Attica & Freedom.—Messrs. Merrick and Bullis, of Buffalo, have made the proposition that if $15,000 be raised by the people along the line that they will proceed at once to rebuild this road from Attica to Arcade, N. Y., 36 miles, changing it to standard gage.

Baltimore & Cumberland.—A report was printed in Baltimore during the past week that the directors had finally awarded the contract for the road between Cumberland and Hagerstown, Md. There is no authority for that report. One of the company's officers authorizes the statement that the construction of the road had been tem-

porarily abandoned, but President Davis and Chief Engineer Chauncey Ives, say that it will eventually be built. The reasons assigned for the abandonment is the making of other arrangements for an Eastern outlet for the West Virginia Central & Pittsburg road, which are satisfactory for the present needs; also that the outlook for any great increase in the coal business is not at this time very flattering. At the time the project was set on foot, the West Virginia Central & Pittsburg was having great difficulty in moving its coal from Cumberland east, and the indications were that within a year the output would be so much larger that those facilities would still further hamper traffic. The expected increase did not come, and now the normal output seems to be steadily falling.

Binghamton, Pennsylvania & Southern.—The charter for this road was filed at Harrisburg, Pa., on May 30. The line is to extend from the terminus of the Binghamton & State Line Railroad in Broome County, N. Y., to the town of Wyalusing, Bradford County, Penn., a distance of about 32 miles. The capital stock is $800,000, and Edmund O'Conner, of Binghamton, N. Y., is President.

Burlington & Missouri River.—Contractor Kilpatrick, of the firm of Kilpatrick Brothers & Collins, which is bulding the extension to Billings, Mont., reports that his firm now has 1,500 men on the grading in Wyoming and beyond the State line, but it is proposed to employ 2,000 men as soon as that force can be gathered. The new work commences at Alger, Wy., a few miles beyond Sheridan, which has been the present terminus of the operated line. The track laying has been commenced at that point, and as about 20 miles has been graded beyond the town, there will be no delay in laying the track for that distance.

Calais Belt.—A belt line of railroad has been proposed in order to bring the Canadian Pacific Railroad from St. Stephen, N. B., across the river into Calais, Me. The latter city proposed to give $10,000 to the project, but opposition is now developing.

Cannellton.—This company was chartered in West Virginia last week. The incorporators are J. Tetnal Lea, of Philadelphia; Henry Davis, of Cannellton, W. Va.; J. F. Brown, M. Jackson and E. W. Knight, of Charleston, W. Va. The company has a paid-up capital stock of $30,000, and proposes to build a railroad from Cannellton, on the line of the Kanawha & Michigan Railroad, to Bell Creek, Fayette County, W. Va.

Chattanooga Western.—Special Chancellor Eakin has granted an injunction restraining the county from issuing bonds in the sum of $150,000 to the proposed Chattanooga Western Railroad for building a bridge across the Tennessee River at this point. This is a serious blow to the Chattanooga Western's plans, and unless a special election is held and the majority of the citizens vote in favor of the issuance of the bonds it is hardly probable that either bridge or railroad will be built. The surveys for the railroad have been made to a connection with the Cincinnati Southern. T. J. Nicholl, of Chattanooga, is President.

Chesapeake & Ohio.—The directors of this company make emphatic denials of the truth of the statements in an article published in a Baltimore paper, that the company proposed to extend its system in Southern West Virginia so as to compete with the Norfolk & Western Railroad. The company is not doing any new construction at present, to say nothing of building lines in competition with existing roads which occupy their special fields.

Conestoga Valley.—Work has been resumed on the proposed road from Kennedy's Siding on the Wilmington & Northern, through the Conestoga Valley to Terre Hill and Lancaster, Pa. Five miles of road at the Morgantown end will be built first. David Hartze, of Morgantown, Pa., is temporary Secretary and Treasurer.

Dayton & Cincinnati Terminal.—This company has been chartered in Ohio with a capital stock of $100,000. The incorporators are R. G. Ingersoll, W. R. Brown, Burton R. White, Samuel Hunt, and Frank B. Drake. The terminals are to be the Union station in Dayton, and a point on East Court street, between Broadway and Gilbert avenue, Cincinnati.

Dewing & Sons' Lumber Co.—This company, with headquarters at Point Marion, Pa., is building a railroad seven miles in length from Crickard, Preston County, W. Va., to lumber lands it has recently purchased in that section.

Dry Fork.—This company has completed its line to a point five and one-half miles below Harmon, Randolph County, W. Va., and is pressing the work forward as rapidly as possible. The United States Leather Co. has purchased 36,000 acres of timber land on Red Creek, about six miles from the line of the railroad, and will build a branch to connect the track with the Dry Fork road for carrying out the tan bark.

Duluth, Missabe & Northern.—The officers have filed a map with the Secretary of State at St. Paul, showing the route of the extension to the Adams mining camp, in northern Minnesota. This line is designated the Adams branch.

Erie & Central New York.—The people of Cortland, N. Y., are endeavoring to raise $25,000 by subscription for bonds to secure the completion of the proposed Erie & Central New York from Cortland to Cincinnatus before November. They have obtained $13,000.

French Creek & Little Kanawha.—An election will be held in Meade and Banks Districts, Upshur County, W. Va., on Saturday next, to decide the proposition to issue bonds for $30,000 as a subscription to the capital stock of this company. It has been organized to build a standard gage railroad from Hampton, on the West Virginia & Pittsburg Railroad, in Upshur County, to Bodkin Springs, Lewis County. The road is intended for the present to open up timber and coal territory and to give access to a medicinal spring at Bodkin Springs, now reached by stage.

Greenfield & Northern.—The officers of this company have had surveys made for an extension south of Greenfield, Mo., and also from its northern terminus at Aurora, Mo., north, to connect with the Kansas City, Osceola & Southern, near Clinton. This connecting line is about 50 miles long, and the preliminary survey has just been made. A party of officers and directors of the two railroad companies went on a special train over the road to inspect the route surveyed. In the party were General Manager B. S. Josselyn, of the "Blair Line"; General Manager T. A. Miller and Chief Engineer H. M. Marvin, of the Greenfield & Northern; Thomas S. West, President of the Union Trust Co., of St. Louis; John Scullin, President of the St. Louis Union Depot Railway; W. L. Huse and Alva Mansur, of St. Louis, the latter being directors of the Greenfield & Northern.

Kanawha & Coal River.—A meeting of the stockholders of this company, which operates a coal railroad in West Virginia, in the Kanawha Valley, was called for May 26, to authorize the issue of $100,000 bonds for the purpose of extending the road, making improvements and purchasing rolling stock. On that day it was decided to postpone the meeting till June 25. The amount of the bond issue to be voted on has been increased from $100,000 to $150,000. J. W. Humbird, of Cumberland, Md., is President of the company. It operates 13 miles of railroad from a junction with the Chesapeake & Ohio to Chilton, W. Va.

Lake Street Elevated.—The elevated road is still actively at work in pushing its Northwestern branch to Humboldt Park. The permit for the work will probably be granted in a few days, and the structural work will be at once commenced by Underwood & Green, who are the contractors of the road. Condemnation proceedings have also been instituted for the acquisition of the right of way on the south side of the river, which will give the road a terminal at Franklin street or Fifth avenue, Chicago.

Little Rock, Hot Springs & Texas.—D. C. Rugg, of Hot Springs, Ark., has been elected President, and J. G. Lonsdale, Secretary and Treasurer. They announce that a contract for building 335 miles of the railroad, to be completed September 1, has been let to Uriah Lott, of New York, whose present address is Hot Springs. The amended charter calls for a line of railroad from Hot Springs north to Little Rock, via Benton, and to Fort Smith; west from Hot Springs to Western Indian Territory and thence to Paris, Texas.

Market Street, Richmond & Frankford.— A charter was granted last week at Harrisburg, Pa., to this company, permitting the construction of a railroad in Philadelphia to be operated by other than locomotive power, and occupying the route proposed to be covered by the electric Elevated Railroad. The capital of the company is $180,000, and the Directors are: Walter N. Boyer, President, Radcliffe B. Mills, Milton M. Dorland, W. W. Hirst, all of Philadelphia, and E. A. Graves, of East Berlin. This new charter was obtained, because it is understood that certain provisions in the charter for the construction of the elevated electric road might prove to be defective.

Midland & Northern.—A company with this title has been recently organized at Midland, Mich., to build a short line from that town through Midland County. A charter for the road was filed last week.

Montfort Colonization.—The route of this road is from a junction with the Montreal & Western, near St. Sauveur, Quebec, to the Ottawa & Gatineau Valley Railroad. The total length of the projected road is 154 miles. Surveys have been made for the first 21 miles and part of this section is graded. The company has not let contracts. It employs its own forces, and has at present 500 men on the construction work. About twelve miles of track has been laid from St. Sauveur toward Lachute on the Canadian Pacific. The maximum grade is 105 ft. to the mile, and the surveys for the first 21 miles are through a rough country. Ensébe Senécal is President of the company. A. S. Hamelin is Secretary, and H. H. Dupont is Chief Engineer. The office of the company is at 218 St. Lawrence street, Montreal, Quebec.

North Galveston, Houston & Kansas City.—The new owners of this property propose to build without further delay the extension from the present terminus to Clear Creek, Tex., about six miles. Isaac Heffron, of Galveston, who is now General Manager of the railroad, is having estimates prepared of the cost of completing the railroad to that point. The road is nearly all graded.

Pittsburgh & Lake Erie.—H. Higinbothan, who is interested in the new town site at Marchand, Pa., has made a proposition to the officers of this company to secure a branch up the Monongahela river from the present terminus to the site of Marchand, seven miles above. The right of way has been partly secured and the line has been surveyed by the company.

Port Huron & Lexington.—This company has been chartered in Michigan by Edgar H. Brennan, who is President of the Port Clinton Short Line, and T. W. Bainbridge, of Toledo, George Shaffer, C. W. Harrah, William C. Maybury and Elwood T. Hance, of Detroit, and Col. William Nichols, of New York. The route will be surveyed this week between Port Huron and Lexington, Mich.

Rome, Watertown & Ogdensburg.—A branch of the line from Wilson Station, near Lewiston, N. Y., to Wilson Harbor on Lake Ontario, is likely to be carried out during the Summer. The branch will be only about two miles long, and the town's people of Wilson agree to secure the right of way. Richard Williamson and Robert M. Campbell are chiefly interested in the construction of the line.

Southern & Electric.—This company, which was mentioned in the *Railroad Gazette* of May 18 under the name of the Benwood & Moundsville Railroad has adopted the name given above. The right of way has been secured for the entire distance, the County Court of Marshall County, W. Va., granting the use of an unused portion of the county road through "The Narrows," a close point, where trouble was found in getting a road-bed without building a trestle nearly two miles long. Col. Benjamin Wilson, of Clarksburg, W. Va., is at the head of the enterprise.

Toledo, St. Louis & Kansas City.—Articles of consolidation were filed in Illinois last week by the Bluffton, Kokomo & Southwestern, the Toledo, Dupont & Western, and the Toledo, Charleston & St. Louis companies. The consolidated company is to be known as the Toledo, St. Louis & Kansas City Company, with principal office at Toledo, O. The capital is $18,055,000, of which $5,850,000 are 4 per cent. bonds, and the balance common stock. The directors are James M. Quigley, Isaac White and Robert G. Ingersoll, all of New York; Clarence Brown, Frederick I. Geddes and Charles L. Luce, of Toledo, O.; Henry A. Neal, M. Chapman and W. Patton, of Charleston, Ill.; G. L. Bradbury, W. S. Bush, Henry C. Parker and Oscar W. Bell, of Peoria. James Quigley is President, and C. W. White Secretary of the consolidated road.

South Jersey. —The company has decided to formally open its line to Cape May, N. J., on June 23.

Washington & Chesapeake Beach.—The United States Circuit Court at Baltimore has issued an order requiring the Washington & Chesapeake Beach Railroad Company to show cause on June 13 why a receiver should not be appointed. The suit asking for a receiver was filed by Joesph W. Coffin, of New York, John M. Sullivan, of New York, and Edward L. Suffern, of New Jersey, trading as Coffin, Sullivan & Co. This firm has the contract to build the railroad from Washington, D. C., to Chesapeake Beach, Md., 30 miles. They claim that the railroad company owes them for the construction work done inApril and May, and is insolvent.

Washington Southern.—Work on the new cut-off, near Shelton, Mason County, Wash., is progressing favorably and the track will be completed during June. The grading for the first mile is about completed and the Shelton Mill is engaged in getting out the bridge timbers for the trestles. The work includes the building of six miles of road. Henry & Balch, of Seattle, are the contractors.

Wheeling & Elm Grove.—The extension of this road from Elm Grove to Triadelphia, W. Va., five miles along the Wheeling Creek valley, will probably be built this summer. The surveys have been completed, and agents are at work on the right of way. Henry Weisgerber, of Wheeling, is General Superintendent, and Gilmore Brown Chief Engineer.

Wilkes Barre & Eastern.—This line was formally opened for railroad passenger travel on June 4, between New York and Wilkes Barre, Pa., by the New York, Susquehanna & Western, which controls the line. It is an extension of the latter railroad from near Stroudsburg to Wilkes Barre, Pa., 65 miles, and gives that company a short line from New York to Wilkes Barre. The chief object in building the road was to give the Susquehanna & Western a longer haul on the large coal traffic, which it secures from the district about Wilkes Barre, and which heretofore has been sent to Stroudsburg over the Delaware, Lackawanna & Western and other roads. An extensive terminal has been built by the company at Edgewater, N. J., on the Hudson river, opposite Ninty-sixth street, in New York city, which the company is now using.

GENERAL RAILROAD NEWS.

Canadian Pacific.—The company reports gross earnings for April of $1,301,471, a decrease of $297,743 as compared with the same month of last year, and net earnings of $364,806, a decrease of $210,408. For the four months ending April 30 the gross earnings were $5,228,597, a decrease of $734,985 as compared with the corresponding period of last year, and net earnings were $1,335,736, a decrease of $501,622.

Chicago, Burlington & Quincy.—The monthly reports of earnings continue to show heavy losses in gross, which continued reductions in operating expenses more than off-set. Thus with a decrease of $494,000 in April gross earnings, net earnings show an increase of $115,000, about 15 per cent. In March the company's gross earnings decreased over $647,000, yet the officers were able to report a small net increase $18,000, by reducing the operating expenses from the $2,235,000 of 1893, to $1,606,000 in 1894. The gross earnings for the four months of the present year have been $10,280,374. In 1893 they were $12,392,487 for the same period. The operating expenses since January 1 have been $6,555,622, or $2,194,947 less than for the corresponding period in 1893. The result of the year's operations so far is an increase of $82,000 in net earnings. The proportionate fixed charges are also $91,000 less than in the previous year, so that the surplus is $524,000, while in 1893 it was $350,000 for the four months. The decrease of $494,000 reported for April was due chiefly to the falling off in freight receipts by which $360,000 was lost. Passenger earnings were $121,000 less than in the same month of 1893.

The table, giving the monthly report, follows:

Month of April.	1894.	1893.	Inc. or Dec.	
Gross earn	$2,495,646	$2,990,399	D	$494,752
Oper. expen	1,655,324	2,266,033	D	610,708
Net earn	$840,322	$724,366	I	$115,956
1-12 annual charges	800,000	822,880	D	22,880
Surplus	$40,322	Def. $87,514	I	$138,836
Four months ending April 30.				
Gross earn	$10,280,374	$12,392,487	D	$2,112,112
Oper. expen	6,555,622	8,750,569	D	2,194,947
Net earn	$3,724,752	$3,641,918	I	$82,835
4-12ths annual charges	3,200,000	3,291,523	D	91,523
Surplus	$524,752	$350,395	I	$174,358

Chicago, Peoria & St. Louis.—General Manager C. H. Bosworth has issued the following circular: "Arrangements have been made whereby this company will operate the line of railroad between Springfield and Litchfield, Ill., ceasing to operate our through trains between St. Louis and Peoria via Jacksonville, Ill. After June 1 through trains will be operated between Peoria and St. Louis via Springfield. The main line of road will extend from Peoria, Ill., via Pekin, Havana, Springfield and Litchfield to East St. Louis and St. Louis, with a branch from Havana to Jacksonville."

Cincinnati, Jackson & Mackinaw.—President Walston H. Brown, of the railroad, says that there is no truth in the rumor that the road will be absorbed by the Cleveland, Cincinnati, Chicago & St. Louis. In regard to the extension into Cincinnati he said that nearly the entire right of way had been secured, and the work would soon be under way.

Lancaster & Reading Narrow Gauge.—The Quarryville section of the Lancaster & Reading Narrow Gauge Railroad, which extends from Lancaster, Penn., to Quarryville, Lancaster County, a distance of 15 miles, was sold at auction on June 5, at the Philadelphia Exchange, to Charles H. Locher, a Lancaster banker, for $300,000.

Lehigh Valley.—The Easton & Amboy Railroad, a leased line of the Lehigh Valley road, has transferred to the firm of M. Guggenheim's Sons, of New York, mine owners, controlling extensive silver and copper mines in Colorado and Mexico, a tract of 50 acres of land on the east shore of Staten Island Sound, north of Perth Amboy, N. J. The firm proposes erecting a plant costing $1,000,000 at Perth Amboy for smelting and reducing their ores.

New York, Lake Erie & Western.—The earnings and expenses of this company for the month of April, 1894, and for the seven months of the fiscal year, as compared with the same period of 1893, are given in the following table:

Month of April.	1894.	1893.	Decrease.
Gross earn	$1,886,789	$2,378,065	$491,276
Oper. expen	1,464,811	1,626,849	162,038
Balance	$421,978	$751,216	$329,238
Due to leased lines	169,073	221,584	52,511
Net earn	$252,905	$529,632	$276,727
October 1 to April 30.			
Gross earn	$14,480,185	$17,198,932	$2,718,747
Oper. expen	10,545,248	11,594,747	1,049,499
Balance	$3,934,937	$5,604,185	$1,669,248
Due to leased lines	1,322,503	1,535,776	213,272
Net earnings	$2,612,434	$4,068,409	$1,455,975

New York & New England.—A meeting of holders of the first mortgage six and seven per cent. bonds of the

company was held in New York last week. About $2,500,000 bonds were represented, and a committee was appointed with power to take such action as it deems necessary for the protection of the bondholders. Should default be again made when the July coupon is payable the principal of the bonds would become due, or upon the request of the holders of one-tenth of the bonds outstanding the trustees take possession of the property, and upon request of one-fifth of the bonds then unpaid they are empowered to proceed to foreclose. In either case the holders would only receive par and interest for their bonds, whereas they are worth a large premium, having always ranged above 120.

Northern Pacific.—The offer recently made by the Reorganization Committee to lend $1,000,000 to the receivers for the payment of the interest due July 1 on the first mortgage bonds, preventing a default on those bonds, has been accepted by the receivers.

Northern Pacific.—The United States Supreme Court, in an opinion written by Jnstice Field, has decided the suit known as the "Barden Mineral land case," against the railroad company. It involved the title to a large quantity of land claimed as a part of its grant by the Northern Pacific Railroad Company, principally in the State of Montana, and included within the land grants to the road from the government under the act of July 2, 1864. Under the terms of this act mineral lands were excluded from the terms of the grant. Mineral deposits of gold and silver were discovered on some of the lands several years after the railroad had taken possession, and suits over the title ensued, the question at issue being whether the language of the act meant that on lands found to be mineral at the time the grant was made were exempted from its operations, or whether subsequent discoveries that the lands were mineral in character would deprive the company of any title to such lands. The land grants included alternate odd-numbered sections for a width of 40 miles along the road line, embracing in all 80,000 square miles. In the Barden case the Circuit Court of the District of Montana decided in favor of the railroad, the lower court favoring the claimant, and the Circuit Court overruling it. The opinion of the court, delivered by Justice Field, was against the contention of the railroad company that the exemption of lands containing minerals made in the grant was limited to lands which were known to contain these minerals at the date of the act or location of the line of the road. No grant to railroads, said the Justice, had ever been held to pass title to mineral lands, and the practice of the Land Department has uniformly been to refuse to patent lands to a railroad company known to contain minerals prior to the date of patent. He asserted that a want of knowledge at the time of the grant of the land reserved would not give title to such lands, and that it would not be claimed that the government had not the right to reserve parts of public lands in making grants thereof. The original exception of mineral lands was without qualification, and it seemed plain as words could make it that mineral lands, known and unknown, were specially reserved to the United States. He said further: "It was difficult to see on what principle the word "known" could be inserted into the act of Congress. The territory was known to embrace great quantities of minerals, including gold and silver, and in all grants of lands to railroads, mineral lands, except coal and iron, were excepted, and such grants were never known to pass title to minerals. It was impossible at the time of the grant for Congress to know what lands contained minerals, particularly considering the condition of the territory. The United States could not have meant, in such an hour of distress to its finances, to give away the title to such imperial wealth, but left the discovery of minerals to future explorations. It was a certain rule of grants that nothing was conveyed by implication except what was absolutely essential to the enjoyment of the grants.

There is, in our opinion, no force in the claims advanced by the plaintiff (the railroad company). The fact that the lands had been listed at the Land Office in 1868 had no binding force." The Justice announced that the decision of the Circuit Court was reversed, and the cause was remanded with direction to grant the defendants' (Barden and others) demurrer. Justices Brewer, Gray and Shiras dissented from the opinion.

Philadelphia & Reading.—The report of the receivers of the railroad company for the month of April, 1894, shows gross receipts, $1,475,258; gross expenses, $880,437, leaving a profit in operating of $594,821; net receipts from other sources, $34,664, thus showing a gross profit for the month of $629,485. From this is to be deducted $47,280 for equipment payments, $50,000 for terminal trackage, and $705,000 for one-twelfth of the current year's fixed charges estimated, leaving total charges of $802,280, thus showing a net deficit for the month of $172,795; for the corresponding period of last year the net deficit for the month was $72,952. The total deficit for the present fiscal year up to date is $1,218,035, a decrease of $31,185 as compared with the corresponding period for the last fiscal year. The statement of the Philadelphia & Reading Coal & Iron Co., for April, 1894, shows gross receipts of $1,428,055, gross expenses of a loss from mining for the month of $50,839. Adding the fixed charges, the total deficit for the month is $173,040.

St. Joseph & Grand Island.—Default having been made by the railroad company in the payment of the coupons due May last, and the Union Pacific Railroad Company having also failed to deposit $35,000 monthly, as required by its agreement for the payment of such coupons, a committee consisting of Frederic P. Olcott, Chairman; Bernhard Mainzer, of Hallgarten & Co.; William L. Bull, of Edward Sweet & Co., of New York, and Gordon Abbott, Vice-President of the Old Colony Trust Co., of Boston, has been formed for the protection and enforcement of the rights of the bondholders.

Toledo & Ohio Central.—The directors propose the issue of $2,000,000 of 5 per cent. general mortgage bonds. The stockholders will vote on the proposition to issue these bonds on July 2. The officers state that the proposed authorization by the stockholders of these bonds is to provide for the acquisition of terminals in Columbus, O., for the purchase of necessary coal lands, and also to retire some of their oustanding car trust obligations.

Union Pacific.—The receivers have decided to ask instructions of the United States Court at Omaha, in regard to the leases under wihch its branch lines are operated. Some of these lines are valuable, but others show a large deficit in operating. This is especially the case with the Denver, Leadville & Gunnison, and the Kansas Central roads. The petition will show the result from operations of the following feeders, making, in addition to those named above, a total of 1,841 miles. The Carbon Cut-off, 19 miles; Brighton & Boulder branch, 26 miles; Junction City & Fort Kearney Railroad, 88 miles; Omaha & Republican Valley Railway, 482 miles; Salina & Southwestern Railway, 35 miles; Kansas City & Omaha Railroad, 193 miles; Atchison, Colorado & Pacific Railroad, 254 miles; Atchison, Jewell County & Western Railroad, 33 miles; Washington & Idaho Railroad, 154 miles; Oregon Railway Extensions Company, 68 miles.

Virginia & Carolina.—The common council of Petersburg, Va., has voted to accept the proposition of the New York and Philadelphia parties for the purchase of the railroad. The purchasers are to purchase the rights and interest of the city for $100,000 of the first mortgage bonds of the company proposed to be formed. They agree to commence building the road south from the city of Petersburg within 30 days, and to complete the road before December, 1894.

Western New York & Pennsylvania.—The Reorganization Committee announces that $19,000,000 of second mortgage bonds have been deposited under the plan of reconstruction, which is now declared operative. At the request of foreign holders the time for the deposit of scrip and shares without penalty has been extended to July 14, after which date a penalty will be enforced. The committee states that immediate steps will be taken to foreclose the mortgage.

TRAFFIC.

Traffic Notes:

There is talk at Memphis of re-establishing the Freight Bureau which was maintained in that city for a year, but was then abandoned.

The Jacksonville *Times Union* last week printed a long and carefully prepared editorial rehearsing various discriminations in railroad freight rates, which, it is said, are greatly hampering the industrial prosperity of Florida, and demanding that the State establish a railroad commission with power to regulate rates.

The Cincinnati Freight Bureau has not given up its attack on the uniform bill of lading. The last classification (No. 3) adopted by the Trunk and Central Traffic Lines, removed the principal objectionable features, but the petition of the Cincinnati Bureau to the Interstate Commerce Commission has been amended and republished.

The Providence Line between New York, Providence and Boston resumed its daily passenger service on June 4 last, from its magnificent new pier, No. 36 North River, one block above Canal street, New York, and three blocks above Desbrosses Street Ferry. The steamers Connecticut and Massachusetts run on this line, leaving New York daily except Sunday, at 5.30 p. m.

It appears that the advance in through passenger fares on certain trains of the Trunk Lines, which was ordered for June 1, according to the decision of the Board of Rulings, which was published in the *Railroad Gazette* of May 4, did not go into effect, some of the lines making the objection that it would enable passengers to get lower rates by combining locals, and others that a difference in rates on different trains over the same road would cause unnecessary confusion in the minds of the public. The faster trains of these differential lines have been so long regarded as ordinary trains, that to make them limited, in any sense, would be unpopular.

The excursion rate between all stations on the Long Island Railroad has been reduced to 2½ cents a mile. Ten trip tickets will be sold at 2 cents a mile, and mileage books can be used by the members of the holder's family or by his employees. The rate of fare on the "rapid transit" trains to Brooklyn has been reduced from 15 cents to 10 cents, and the ferriage over the Thirty-fourth street route is now 2½ cents a trip, instead of 3 cents, as formerly, if tickets are purchased. It is said that these reductions are the result of an agreement entered into by the company, upon the stipulation that a bill before the Legislature to reduce the rates of fare should be withdrawn.

Freight rates from New York to points in the Southern States are now badly demoralized, the recent reductions, which were begun by the steamship lines, having been met by all lines. Most of the tariffs have been reduced from 40 to 60 per cent., and the reductions apply to prominent points throughout the South as far west as the Mississippi river. It is said that the rates of the East Tennessee, Virginia & Georgia from New York and other eastern points, have been reduced more than 60 per cent. It is said that there will be a meeting of the Southern Railway & Steamship Association in New York on June 13, but no one makes any definite predictions as to the result of it. It is reported from Memphis that passenger rates from that city eastward have also been reduced, but no definite figures are given.

Chicago Traffic Matters.

CHICAGO, June 6, 1894.

There is imminent danger that the new passenger agreement of the Western lines will collapse. Following closely the announcements that the lines had agreed not to quote lower than one fare for the round trip on excursion business, and that all side rides were to be abolished, came an announcement by the local association of the Christian Endeavor Societies at Kansas City, of a round trip rate of $24.75 from Kansas City to Cleveland, for the annual convention next month, to include sleeping-car fare, meals en route, five days' lodging at Cleveland, and various side rider while there. This at once set the Chicago roads at work tracing out the proposed route, which was found to be the Burlington to St. Louis, and the Clover Leaf from there. The fare from St. Louis as agreed is $19.75, and the one-way rate from Kansas City to St. Louis is $7.50. The Atchison and Rock Island are anxious to know whether the Clover Leaf has generously agreed to stand all the extra expense involved in the offer, or whether the Burlington has agreed to participate in it, and has accordingly called upon the latter line to explain the matter. The circular of the Kansas City organization let the cat out of the bag as to the Western road involved by announcing that meals would be served at Brookfield, Mo. The Burlington is the only line having a station at Brookfield. Another excursion which is likely to cause trouble, is a $44 round trip rate made by the Pennsylvania and the Burlington from Cincinnati to Denver and return, for the Mystic Shriners, including sleeping car accommodations, three days' hotel bills at Denver, and other attractions. The Atchison and the Rock Island say that they subscribed to the agreement with clean hands and with the intention of keeping it in good faith, and that if they become convinced that any of their competitors have violated it, they will make such rates in retaliation as will materially change the aspect of the situation.

The result of the conference between Eastern and Western lines last week, on the question of through rates via Chicago and Mississippi River crossings, was the submission of the entire question to a joint committee of five representatives from the Central Traffic Association, and five representatives of Western lines, who will meet with a like committee of five from the Trunk Lines at New York, June 13, at which time it is hoped a satisfactory agreement may be reached. Pending this meeting, the Central Traffic Lines have withdrawn their notice of the cancellation of all westbound through rates on June 15.

An attempt was made last week to get a meeting of interested lines to consider the reformation of the Trans-Continental Association. The Atchison announced that it was not yet in position to consider a proposition of this kind, and the meeting was called off. It is understood that the Southern Pacific took the same stand, which would indicate that the reorganization of an association West of the Rocky Mountains depends upon the outcome of the present situation in California.

The announcement of the application of Chicago rates on merchandise from New York and New England to Duluth, via the Duluth and Ontario Transportation Company, will render it necessary for the all rail lines to meet the rates, or else go out of this business.

The Chicago, Milwaukee & St. Paul, and Chicago & Northwestern will shorten the running time of their fast trains between Chicago and Milwaukee to two hours, effective June 10. This is the fastest regular time ever attempted between the two points.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending June 2, amounted to 49,417 tons, against 48,818 tons during the preceding week, an increase of 599 tons, and against 52,559 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	W'k to June 2.		W'k to May 26.	
	Tons.	P. c.	Tons.	P.c.
Michigan Central	4,068	8.2	4,263	8.7
Wabash	4,548	9.2	5,520	11.3
Lake Shore & Mich. South	6,368	12.9	7,003	14.4
Pitts., Ft. Wayne & Chicago	4,751	9.6	5,559	11.4
Pitts., Cin., Chicago & St. L.	6,402	13.0	5,163	10.6
Baltimore & Ohio	2,950	6.0	2,852	5.8
Chicago & Grand Trunk	5,750	11.6	4,589	9.4
New York, Chic. & St. Louis	5,344	10.8	5,468	11.2
Chicago & Erie	6,862	13.9	5,836	11.9
C. C. C. & St. Louis	2,374	4.8	2,565	5.3
Totals	49,417	100.0	48,818	100.0

Of the above shipments, 1,753 tons were flour, 19,054 tons grain and millstuff, 7,707 tons cured meats, 10,813 tons dressed beef, 1,679 tons butter, 1,258 tons hides, and 4,961 tons lumber. Lake lines carried 35,849 tons against 47,382 tons last week.

Other Chicago traffic news will be found on page 409.

Organization of Lake Lines.

A meeting was held to establish an organization of the lake lines, at which the following companies were represented: The Union Steamboat Company, the Western Transit Company, the Anchor Line, the Northern Steamship Company, the Lehigh Valley Transportation Company, the Lackawanna Transportation Company, the Milwaukee, St. Paul & Buffalo Steamship Company, the Clover Leaf Line and the Union Transit Company. A permanent organization, probably to be known as the Lake Line Association, was formed, and Henry C. French chosen as commissioner. Commissioner French was directed to go to Chicago to confer with the lake lines there, and J. W. Midgley, Commissioner of the Western Traffic Association, looking to the adjustment of export rates.

Inter-state Commerce Commission.

The Interstate Commerce Commission, in an opinion by Commissioner Clements, has decided the case of the Cincinnati Freight Bureau against the Cincinnati, New Orleans & Texas Pacific and others, and the Chicago Freight Bureau against the Louisville, New Albany & Chicago, and others, in favor of complainants. The commission decides that the division of territory between Eastern and Western lines provided for in the Southern Railway & Steamship Association agreement, is without warrant in law and appears to be made for the benefit of carriers without regard to the interests of shippers in the territory so divided, to whom it is in effect a denial of the privilege of shipping their goods or produce to market by the line or route they may prefer. The provision of the agreement for the payment of "penalties" by its members is tantamount to a pooling combination. The complaints relate to rates from Cincinnati and Chicago to Southern points, and the commission orders important reductions in rates on all the different classes of freight.

The Pooling Bill.

The proposition to repeal the anti-pooling clause (section 5) of the Interstate Commerce law came up in Congress on May 31, in a revised form, the new bill being No. 7,273. The report from the committee accompanying it, by Representative Patterson, states that there has been evidenced a consensus of opinion on the part of the State Commissioners and the Interstate Commerce Commission to permit competing roads to enter into contracts for division of earnings under restrictions. By rebates, drawbacks and other devices, large shippers are favored, while small shippers are required to pay published rates. Thus the railroads are impoverished, and the destruction of small enterprise brought about. A system by which competing railroads may divide their earnings, says the report, would remove the motive for discrimination so that large and small shippers would fare alike. Extortion by pooling contracts is the danger to be avoided, but Mr. Patterson argues that natural causes exert a powerful influence to make reasonable competition between localities.

The bill materially enlarges the jurisdiction and powers of the Interstate Commerce Commission. If the commission determines that a contract results in discrimination or violation of the law, it is clothed with power to disapprove, whereupon the contract ceases to be lawful or enforceable, and the parties are relegated to the law as it now is, and required to observe it. From an order disapproving a contract an appeal lies to a United States Circuit Court, and to the Supreme Court, but while appeals are pending contracts are unlawful and unenforceable.

This bill makes shippers alone punishable for frauds against the companies by means of false bills or otherwise, while the corporations, instead of their officers or agents, are to be punished for infractions of the law.

Procedure under the bill is materially changed. Circuit Courts are required to give cases from the commission precedence over all others, and the Supreme Courts to advance them as it does cases in which the government is a party. All evidence taken before the commission is to be filed as evidence for the court, and if more evidence is needed, it is to be taken by the commission. In this way the court decides on the exact case certified.